Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME IX.] NEW-YORK SEPTEMBER 24, 1853. [NUMBER 2.

THE
SCIENTIFIC AMERICAN,
PUBLISHED WEEKLY,
At 128 Fulton street, N. Y. (Sun Buildings.)
BY MUNN & CO.

Agents.

Hotchkiss & Co., Boston.	Dexter & Bro. New York.
Stokes & Bro., Philadelphia.	B. Dawson, Montreal, C.E.
Cook, Kinney & Co., San Francisco.	M. Boullemet, Mobile, Ala.
	E. W. Wiley, New Orleans.
Le Count & Strong, San Fran.	E. G. Fuller, Halifax, N. S.
Avery Bellford & Co., London	M.M. Gardissal & Co. Paris

Responsible Agents may also be found in all the principal cities and towns in the United States.

TERMS—$2 a-year:—$1 in advance and the remainder in six months.

Raising Weights under Water by Gas.

Dr. Gianetti, a Corsican savant at Paris, recently performed an experiment in the Seine designed to show the possibility of raising a heavy body from the water by means of the expansive force of carbonic acid generated by chemical means in a suitable vessel. The apparatus consisted of a small leather bag or balloon, attached to which was a smaller metallic vessel, having two compartments connected by a valve which could be pulled open by a string: one of the compartments was charged with bicarbonate of soda, the other with muriatic acid. The vessel being attached to the body to be raised, the string was pulled, the gas being liberated, inflated the balloon, and in this way the body was soon elevated to the surface. In Mr. Gianetti's experiment it was found that a balloon of a foot and a half in diameter was sufficient to raise a weight of one hundred kilogrammes (2 cwt.) from the bottom of the Seine.—Ex.

[A cheaper and more convenient way to elevate heavy bodies under water, would be a block and tackle, and the use of a windlass.—When a body has to be lifted from under water it has first to be found, and when this is done it is surely more easy to clamp it with a pair of tongs, or a hook, and pull away on the lever of a windlass, than to have a bag filled with marble dust, or the carbonate of soda, which has to be tied to the weight to be elevated and the gas then set free by an acid. Oh, simplicity in invention; how often are thy claims overlooked.

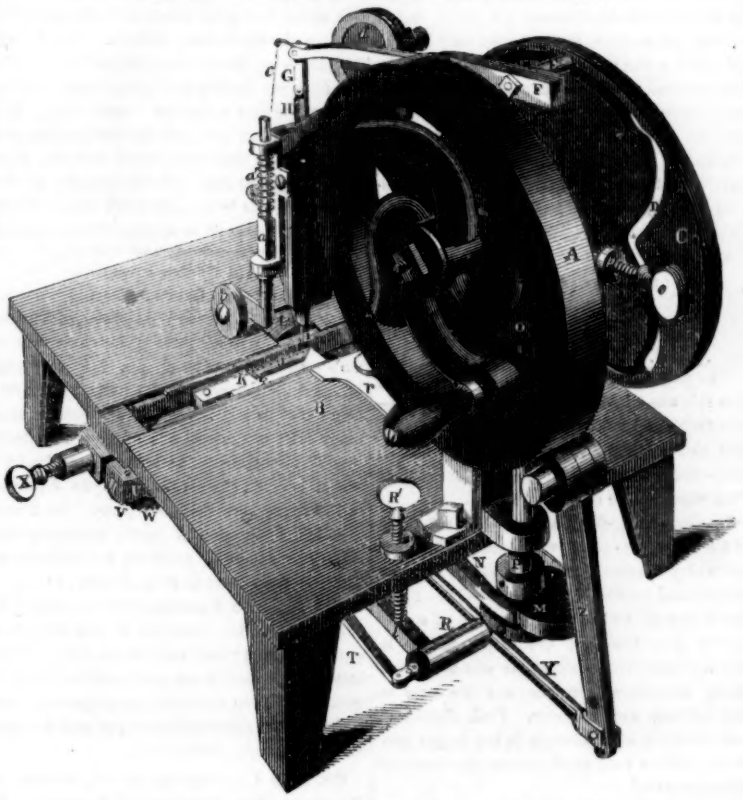
A New Article of Trade in China.

The "Washington Star" says that a distinguished naturalist (Prof. Agassiz, we believe) has directed the attention of our government to a new source of national wealth—as an article of trade—on our southern coasts, in the sea slug. This article, an unseemly jelly-looking substance, of a dirty brown color, hard, rigid, and scarcely possessing any power of locomotion or appearance of animation, and varying in size from, say six inches in length and two or three in girth, to two feet long and six or eight inches girth, may always be found in very large quantities strewed on the shore, between high and low water marks, on our southern coasts.

The Chinese use it as we do Iceland moss and isinglass. It is taken to them in immense quantities from the tropical shores of Asia and Australia, annually. It is caught by hand in shallow water, and usually speared in deeper water; and, after being dried in the sun, it is smoked over a wood fire, when it is ready for shipment. Macassar is at present the principal point from whence it is shipped to China. At that point, from which some eight or nine hundred thousand weight are now annually sent to China, its value varies from $8 to $110 per picul (of 133 1-4 lbs.,) according to quality; there being some thirty different qualities of the article, which are only to be distinguished by experts in the trade. The western shores of New Guinea, the southern shores of Australia to Ceylon, and latterly, the shores of the Mauritus, supply large quantities of it.

By the latest news from Europe, the Turkish question was still unsettled. What a tempest in a tea-pot.

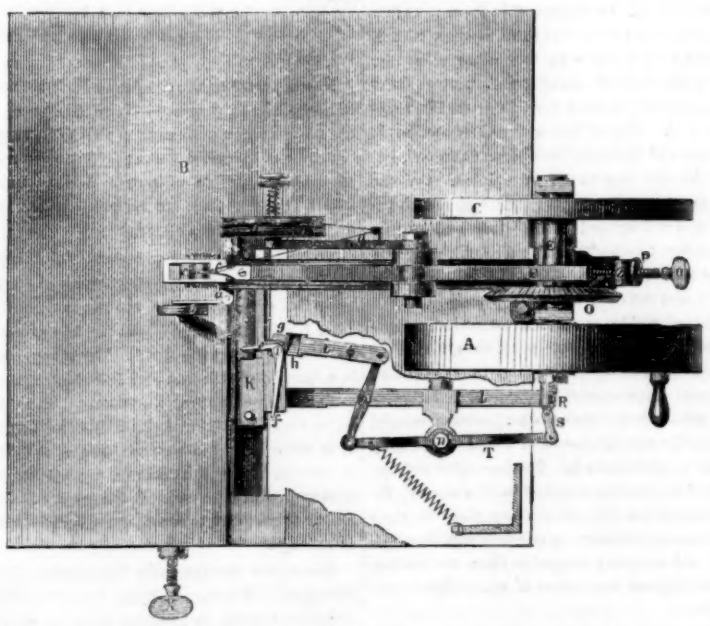
MILLER'S SEWING MACHINE.---Fig. 1.



Among the many sewing machines which have been illustrated in our columns, the annexed engravings represent a new one, for which a patent was granted to Charles Miller, of the city of St. Louis, Mo., on the 20th of July last year. Figure 1 is a perspective view, and figure 2 is a plan view, with part of the top broken off to render the operation more clear. The same letters refer to like parts.

This sewing machine, like others, forms its stitches by the interlocking of two threads, one of which is passed through the cloth in the form of a loop, and the other is carried by a shuttle below the cloth through the loop. The improvement consists of an improved stop motion to prevent the movement of the cloth if the thread should break or catch in the seam; also, a means of making a stitch like the "back stitch," in hand sewing. B is a table which carries the machinery; A is the fly wheel on the shaft for driving the machine; C is a plate wheel on the same shaft as the fly wheel; it has a cam groove, D, in it; F is the needle arm, it is secured on an axis near the middle, which allows it to vibrate like a walking beam; E is a pin in arm, F, which is inserted into the cam

Figure 2.



groove, D, so that when the wheel, C, revolves, it gives a vibratory motion to F; G is the connecting rod of the needle stock, H; I is the needle which has its eye near the point; *d* is the thread spool for supplying the needle; *c* is the thread; *a* is a rod with a spring, *a'*, around it, and a small roller, *b*, on its foot, this is for holding the cloth to be sewed, on the table, as it is fed forward to the needle by a rotating groove-faced roller, L, under the cloth. The feed motion is given by the bevel pinion, O, which gears into a small pinion on the head of the short vertical shaft, P. This short shaft has two small cam plates, M A, on it; the one, M, works between the forks of an arm, N, which drives the shuttle bolt, K, and the shuttle J, in its raceway, back and forth, because the cam, M, is an eccentric, and gives the arm, N, a reciprocating motion. R is a small cylinder; in it works a pin with the rod at one end; the other end presses against the lower edge of the cam, Q, so that, as the shaft, P, revolves, it gives a vibratory motion to the bar, *l*, which moves a ratchet in the shoulder, U, that takes into the ratchet wheel, W, from the shaft of which proceeds a small cord to the shaft of the cloth-feeding wheel, L, and this moves it forward to feed the cloth a specific distance for every stitch. The screw, X, tightens up and regulates the feed.

The way in which the feed of the cloth is stopped, when the thread of the needle breaks or gets fast in the seam, is as follows, and which is shown in figure 2:—In sewing, the needle thread, to form the lock-stitch, passes over the shuttle, J; *e* is a vibratory finger resting on this shuttle; this finger has a small nib, *f*, projecting downward. This stop-finger is near the bell-crank, *i k* T, which is connected by a joint, *n*, to the piston pin in cylinder R. If the end of the bell crank at *h* were drawn towards *f*, it would vibrate on its axis, *n*, and draw out the pin that is operated by the cam, Q, fig. 1, and the feed-motion of the ratchet arm, *l*, will stop. This is done if the thread, *c*, breaks, for it will not then turn *e* on its axis, consequently the nib, *f*, will catch in a small notch at *g*, and vibrate the bell crank so as to throw out the pin in R, and arrest the feed motion of the cloth. The stop-motion finger, *e*, when the thread, *c*, is working, is kept continually vibrating, the thread pushes *e* to the one side, when the shuttle is going back, and a projection at *h* throws it into position again when it is returning, so as to keep the nib, *f*, from catching into the notch at *h*, when the shuttle is coming back to stop the feed motion.

This sewing machine is now at work in the Crystal Palace, alongside of Wilson's and Singer's, and is the only one which, by a transverse motion of the cloth feed-roller, attempts to sew button holes. This is done by the pin, *p*, which is pressed by the screw, *o*, against the small cam on the axis of the driving shaft, which vibrates the rod, Z, connected with the one, Y, which traverses the feed roller, L, in the direction of its axis, and feeds the cloth transversely to its common motion, so as to make one stitch pass over the eye of the button hole, and the next pass through the cloth, binding it. This motion is thrown out of gear, when desired, by the screw, *o*. The stop motion is similar in principle to that applied to power looms, and is an ingenious contrivance. The common stitch is produced like those in other sewing machines; the "back-stitch" is not represented, but is embraced in the patent granted. Mr. Miller has recently made application for his improvement in the transverse button-hole stitch. J. A. Ross, of St. Louis, the assignee of this patent, is at present residing in this city, and from him more information may be obtained.

Death of a Young Mechanic.

The "Suffolk Democrat" records the death of Frederick W. Glover, the only son of Daniel Glover, Esq., of Middletown, Conn., a youth of 16 years of age, who gave great promise of mechanical ingenuity and skill. He corresponded with us respecting a very ingenious plan to prevent accidents at railway drawbridges, whereby the engine was made to close the draw if it was open before the train reached it. He was distinguished for an amiable disposition, great intelligence for his age, and fine mechanical taste.

Honor, like a shadow, follows those who flee from it, but flees from those that pursue it.

A Question of Chemistry at Law.

A very particular chemical question has recently been tried in a Jury Court in Scotland; as one of scientific importance, and connected with mining and mineralogy, an account of it must be of great interest to many of our readers. The plaintiffs were William and Elizabeth Gillespie, (his wife;) the defendants, James Russell and his son. In April 1850, the Russells obtained a lease of the whole coal, ironstone, iron-ore, limestone, and fire-clay, but no other minerals in the land of Torbane Hill, the property of the plaintiffs, for 25 years for £300 ($1500) per year. The Russells had sunk their shaft and had come upon coal, iron, lime and fire-clay of workable value, but they did not work them, but raised 19,000 tuns of a substance which they sold under the name of "gas coal." This the Gillespies alleged was not a mineral comprehended in the lease of defendants, that it was not coal, and that the contract was violated.—The defendants asserted that it was "coal," and this was the question at issue; namely, whether it was coal or another mineral—a chemical question entirely. Eminent chemists appeared on both sides as witnesses.

On the part of the plaintiffs, Profs. Ansted and Anderson, Mr. Brande, the celebrated chemist, Alexander Rose, the Rev. Dr. Anderson, Dr. George Wilson, and Dr. J. T. Cooper, were severally examined. Mr. Brande produced an analysis he had made of the mineral, from which it appeared that 100 parts of it contained only 10 of carbon, 26 of ash, and 70 of volatile matter, principally carburetted hydrogen. The result of this analysis satisfied him that it was not coal.—The effect of the evidence of the other eminent chemists and mineralogists seemed to be that it was not coal, but a new mineral hitherto unknown—a species of bituminous shale. That a substance containing less than 68 or 70 per cent of carbon could not be considered as coal; that it was rather a kind of bituminous clay. It was lower in specific gravity than coal, and lower in scale of hardness. It was less brittle than coal; its streak was brown instead of black; it was slightly translucent, while coal was opaque. It was a clay largely impregnated with bitumen, but had no property in common with coal, except that gas might be produced from it. The Torbane mineral left no available coke, and no substance could be called coke unless it gave a considerable residuum of coke. On cross-examination it was however admitted that some substance which went to compose coal might be found in Torbane mineral, though in different degrees and arrangements. Further scientific witnesses were then examined as to the appearance of the mineral under the microscope; and they gave their opinion that it was different in organic structure from coal, and presented no traces of vegetable origin. Operative coal miners and coal managers were then examined. The former had worked in the Torbane pits and in coal mines; and they stated that the mineral when struck produced a deaf and not a clear sound like coal; that it emitted a smell of gas so strong as to produce headaches, or to make them vomit, which they had never experienced when working coal, and that it was very difficult to work compared to coal; and the latter as practical men gave their opinion that the mineral was not coal. Scientific and practical evidence was further given that the mineral yielded gas of a highly illuminating power and in large quantity—14,000 cubic feet of gas to the ton; whilst the best Cannel (the Wigan Cannel) only produced 11,500; that it yielded much more tar than any other coal, and much less ammonia; and that although not coal, it had been probably so called from also producing gas, which it produced of high quality.

On the part of the defendants, Prof. Johnson, of Durham, Prof. Ramsey, of London, Professor Hoffman, Chemist in the Government School of Mines, Professor Fyfe, Dr. Douglas Maclagan, Dr. Gregory, Professor Frankland, Mr. Dicenson, Government Inspector of Coal Mines in England, and a number of other scientific, practical, and operative witnesses were examined. The result of their evidence was, that it was a coal of the Cannel or Parrot kind, differing in no essential respect from that sort of coal, but agreeing geologically and chemically with it in all its characteristics. Professor Hoffman, who had been a pupil, and for some time assistant, of Liebig, had subjected it to the usual solvents and tests, to ascertain if it was a mixture of bituminous matter, and he only discovered the merest trace of bitumen, and it was not reduced to a fluid state, as would have been the case if it was bitumen. The ingredients of coal varied considerably, but carbon was the largest; and from 100 parts of this substance he extracted 65·66 of carbon. There was nearly 9 per cent of hydrogen, but he did not consider this incompatible with this mineral being coal; he did not believe there was bitumen in this body. Coal shales generally contain 60 per cent of earthy matter; this mineral could not be called shale, or schist, its predominant constituents not being earthy matter, as in shale, but carbonaceous: he considered it a true coal. Dr. Fyfe stated that he had analysed all the Cannel coals in Scotland, in order to obtain their gas producing qualities; and he had also analysed the disputed mineral, and it in no respect differed from the ordinary Cannel coals, except in being of a very superior quality. Comparing its constituents with Capeldrae Cannel coal, he found them to be as follows:—

TORBANE HILL MINERAL.		CAPELDRAE CANNEL.	
Carbon	60·25	Carbon	56·7
Hydrogen	8·8	Hydrogen	6·8
Oxygen	3·6	Oxygen	8·8
Nitrogen	1·5	Nitrogen	1·9
Sulphur	·3	Sulphur	·25
Ash	25·6	Ash	25·4

The only difference between the two was, that this was a better gas coal than the other.—The further scientific evidence went to establish that this mineral burnt exactly like a Cannel coal—that, when heated in a retort, its products were exactly those of a Cannel.

Dr. Douglas Maclagan exposed this substance to the action of naphtha, which made substances containing bitumen yield it; he found only an infinitesimal quantity—mere traces of it. Shale was a mineral with a larger quantity of earthy matter than coal, but the earthy matter in this substance was incompatable with its being a shale. Carbonaceous matter was the base of this mineral, and not clay. Prof. Frankland could discover no bitumen in it, but its gas producing powers were much greater than those of bituminous coal.

It was found among the ordinary coal strata. Several scientific witnesses of the highest repute were then examined upon the structure of the mineral as exhibited by the microscope. Its structure was vegetable, characteristic of the fossil plants of the coal formation. The woody fibre, and the cellular tissue, were found in this mineral, while shales did not exhibit any traces of vegetable structure.

After the jury had been addressed by most eminent counsel on both sides, the Lord President summed up. The jury were to determine whether the substance in question fell within the term whole coal in the demise, for it was not pretended that it came within any other terms specified in it. On the one side there were four geologists, who gave it as their opinion that it was not coal, and five on the other side who said it was coal, all speaking with perfect sincerity, according to what they, as geologists, classed as coal. Men of the highest reputation in geology and chemistry had been examined, but they differed very much in opinion. On one side there were five of the most eminent chemists, who had applied all their skill and energy to find out whether it was coal or not, and who had expressed themselves as clearly of opinion that it was not coal, while ten, equally eminent on the other side, were of a diametrically opposite opinion. Is this substance, then, a coal or not, in the ordinary language of those who deal in it, and of the country? because to find a scientific definition of coal after what has been brought to light for the last five days would be, he said, indeed a difficult thing. The jury, after retiring about five minutes, returned with a verdict for the defendants, thus establishing that, in their opinion, the substance in question was, in effect, coal, and removing altogether from the company the slightest imputation of concealment and deceit.

The evidence in this case, impresses us painfully with respect to the chemical abilities of men whose names are now famous in the annals of science. What a conflict; and that not on the speculative opinion of whether the mineral was coal or shale, but the details of every analysis. It is indeed difficult to reconcile experiments, when one chemist produces 10 parts of carbon out of 100, and another 60 parts out of the same quantity. A witness on one side demonstrated that it was largely impregnated with bitumen, while another as clearly demonstrated that it scarcely contained a trace of it. Such testimony is enough to shake public confidence in the purest state of chemical knowledge, and must diminish our reliances in the dogmas propounded by scientific experimentalists in the laboratory. We believe the decision of the jury to be right, although that great chemist, Rose, was brought from France to prove the contrary. On such a question as this, Prof. Fyfe was the most competent chemist, for no man in the world has devoted so much attention to the analysis of coals, and with so much success. We happen to know what the substance is, and as it is similar in every respect to Boghead coal, it is nothing more than a superior Cannel coal,. It is the best kind in the world for making gas, containing nearly three times more, than the common bituminous coal. Such a question as this has never come before any of the courts in our country, but may do so at some future period.

Recent Foreign Inventions.

NEW EXPLOSIVE COMPOUNDS (GUN POWDER AND PRIMING.)—George Winnewater, of London, patentee.—There are three explosive compounds embraced in the patent. No. 1 is composed of fulminating mercury 300 parts by weight; chlorate of potassa 288 parts, sulphate of antimony 312; of charcoal 40; of nitre 20; ferrocyanide of potassium 23; binoxyde of lead 6; and etheroxylin (that is 75 pyroxylin dissolved in 150 of sulphuric acid) 900 parts. No. 2 contains fulminating-zinc 75 parts; chlorate of potassa 4; sulphite of antimony 7; binoxyde of lead 15; ferro cyanide of potassium 1; etheroxylin, 224. No. 3 consists of amorphous phosphorous 75 parts; binoxyde of lead 64; charcoal 9; nitre 6; and etheroxylin 107. These materials are ground separately and mixed with great care. They are made into pellets and used both as substitutes for gunpowder and for priming—percussion composition.

OIL FROM COAL SHALES, &c.—J. Perkins, of Manchester, Eng., patentee.—This invention is for distilling at a low temperature coal shales, and other bituminous substances found in the carboniferous formations yielding bituminous matter, and obtaining therefrom paraffine. The apparatus used is simply a common gas retort, built up in brickwork and heated by a fire, to which is connected a coil of iron pipe immersed in cold water to condense the distilled matters.

MAKING CARBONATE OF SODA.—Chas. F. Merckshagen, of Barmen, Prussia, patentee—The inventor mixes sulphate of soda with charcoal, and calcines them to produce sulphuret of sodium; this is then decomposed by mixing it with an excess of bicarbonate of soda and exposing the mixture in a moist state in a reverberatory furnace. The product is then washed, evaporated and dried.

NEW METALLIC ALLOY.—Andre M. Massonett, of Paris, France, patentee.—Take of copper filings 5 ozs.; burnt calamine or zinc 12 1-2 ozs.; bitartrate of potash 10 ozs.; hydrochlorate of ammonia or nitrate of potash 5 ozs.; quick lime 1 1-4 ozs.; these are melted together in a crucible and cast into ingots.

TO PREPARE WOOD FOR RAILWAY SLEEPERS.—Wm. Romaire, of London, patentee.—For 50 cubic feet of timber take 3 bushels of unslacked lime, 1 gallon of the oil of gas tar, and as much water as will cover the wood. These are placed in a tank lined with lead and boiled—the wood in the liquor—for about three days. The timber is then removed and either dried in the sun, or in ovens heated to 70 deg. If the timber is to be used in very hot climates, about 4 ounces of arsenic should be added to the solution. The timber so prepared is excellent for docks as well as railways.

PESERVING METALS FROM CORROSION.—John Carvalho de Mideiros, of Paris, patentee.—This invention consists in applying mercury to any metallic surface, to which it can be applied to preserve iron or any sheathing of ships from being attacked by barnacles, &c., it also prevents oxydization.

Soap and Paint.

Soap or strong soap-suds, will destroy green paint more readily than any other colors. The ley has the same effect on oil paints that it has with grease. Many painted rooms, window blinds, &c., are soiled by carelessness or ignorance of washer-women, in the application of soap or strong soap water. When it does not destroy the paint, it affects the lustre.

A Great Railroad Scheme.

It is reported that a company to construct a railroad to the Pacific is now being organized in this city, at the head of which, it is said, are Erastus Corning, Simeon Draper, and other capitalists. The object is to provide a substantial six feet gauge road from New York to the Pacific ocean, running through Missouri, Arkansas, Texas, Northern Mexico, and California. The estimated cost is $100,000,000, which is to be the capital of the company. It is said that thirteen of the most responsible contractors of the United States have undertaken to build one hundred miles each on the route above described, and to take in payment fifty per cent. cash, twenty-five per cent. in the bonds of the company, and twenty-five per cent. in its stock.

Photography on Stone.

The "Comtes Rendus" says that M. Barreswill and Lemercier propose to prepare a negative picture on paper, and then produce a positive picture on lithographic stone. The negative is obtained by any method, the most rapid being preferable. The positive is produced by a fatty or resinous coating laid on the stone, and capable of being rendered soluble in some solvent by the action ot light (and perhaps of oxygen). The negative is laid upon the stone thus prepared, and covered with a glass plate; the whole is then exposed to the sun, the stone is then washed with the solvent, and then treated by the ordinary processes of lithography.—The authors have hitherto employed asphaltum for coating the stone, and sulphuric ether as the solvent. They expect in this manner to reproduce lithographs.

Delegates to the Worlds Fair from Washington.

At the last meeting of the National Institute at Washington, the following Delegates were appointed to visit the Exhibition of the World's Fair at the Crystal Palace, New York:—Col. Peter Force, Prof. A. D. Bache, Prof. Joseph Henry, Capt. Wm. Easby, Robert Mills, Esq., Prof. J. H. C. Coffin, Commander Chas. Wilkes, Prof. L. D. Gale, Dr. Thos. T. Everett, J. C. C. Kennedy, Dr. Daniel Breed, Wm. Q. Force, Esq.

They will meet in the city of New York on the first, Tuesday of October, at 9 o'clock, A. M., and visit the Exhibition during the week. It is expected that each delegate will select some subjects upon which he will make a report.

Prof. Gale, and Drs. Everett and Breed are Examiners in the Patent Office.

Agassiz's Cabinet Sold.

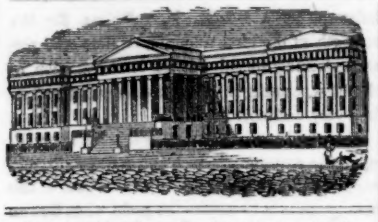
The "Boston Traveller" has been informed that the valuable cabinet of many thousand specimens in Comparative Anatomy, Mineralogy, and other sciences, collected in the course of years by that distinguished savant, Prof. Agassiz, has been purchased for the University at Cambridge, at the price, as is rumored, of $12,500, the greater part of which, it is said, was obtained by private subscription.

New Kind of Cotton.

A new kind of cotton has been brought from among the Pino Indians of New Mexico, by an officer of the Mexican Boundary Commission.—Its peculiarity consists in a fine silky staple, superior in length and strength to all kinds previously known. We learn that the seed has been introduced into Texas, and that the plant will soon be grown there extensively. It has also the great advantage of not degenerating, and not requiring a renewal of seed. The plant, if all these peculiarities are proved permanently to belong to it, must effect a revolution in cotton raising.

A New Railroad for Broadway.

A new elevated railroad for Broadway, invented by Wm. Dietz, of Albany, has been very favorably noticed by some of our cotemporaries; as we may be able to present an engraving of it in a few weeks, we will not further allude to it at present.



]Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING SEPTEMBER 13, 1853.

GEAR OF VARIABLE CUT-OFF VALVES FOR STEAM ENGINES—By M. W. Baldwin, of Philadelphia, Pa.: I claim the arrangement of the sliding pivot block fitted with a stem, connected with the sector by straps, chains, or cogs, the hand lever, and the intermediate connecting mechanism, as described.

INDIA RUBBER SOLES FOR BOOTS AND SHOES—By John Chilcott & Robert Snell, of Brooklyn, N. Y.: We claim constructing the whole, or any portion of the sole of a boot or shoe, as described, of india rubber, with the inside and edges covered and protected by leather, which is united with it by any water-proof cement, with or without stitching, and forms a hard, firm, leather edge.

CUTTING BOOTS AND SHOES—By John Chilcott & Robert Snell, of Brooklyn, N. Y. Patented in Belgium Sept. 16, 1852; in France Sept. 17, 1852; in England Sept. 30, 1852: We do not claim the manufacture of boots without crimping; but we claim the form of the piece of leather or other material, as described, by which we are enabled to make what is termed the "upper leather" of a boot, to fit any leg, foot, and heel, not absolutely deformed, of one piece, without crimping or joining other pieces thereto, the distinguishing characteristics of this form being that one half or side of the boot is formed by a part, A, without joint, and the other half or side by the junction of a part, B, folded from the back of the side, A, and part, C, which is partly cut from, or which when flat lays close or near to the front of A above the instep, and partly folded over from the instep; the part C being of such shape as to form one side of the foot, and extend round the heel to the other side, A, and cover an opening made in the lower part of the back, to give the required form to the heel, and also to make part or all of the necessary stiffening.

BED BOTTOMS—By Pierre Demeure & Auguste Maurits, of New York City: We claim the manner of constructing the spring mattress by combining the vertical springs with an elastic or spring net-work of spiral metallic springs for supporting said vertical springs, or for increasing the elasticity so that a person lying upon the bed will be equally supported on all sides, as described.

SHAPE OF SCYTHES—By Wm. P. Greenleaf, of Washington, N. H.: I claim widening and curving the blade of the scythe at the shank, in the manner described, for the purpose of strengthening the same and adapting it to cutting bushes as well as grass.

SAFETY VALVES FOR STEAM BOILERS—By Z. H. Mann, of Cincinnati, Ohio: I claim the construction and application to a safety valve of flutter wheel, governor, and supplementary lever, as described, or equivalent devices, in order to ensure promptness of action and an increase of vent, according to the force of steam; and this I claim either with or without the adjustable link and counter weight, as described.

REVOLVING MANDREL FOR LINING CYLINDERS WITH METAL—By George Potts, of Cincinnati, Ohio: I claim the revolving mandrel, furnished with one or more rollers, whose distance from the axis of the mandrel can be increased or diminished by means of a nut, sleeve, and conical head, as described, or any equivalent device, for the purpose of lining with one metal the interior of a cylinder formed of another metal.

BUCKING CLOTH—By Andrew Robeson, Jr., of Newport, R. I. Patented in England Nov. 8, 1852: I claim the employment of a closed kier or vessel, as described, and extracting the bowking liquor from the lower part of it, and forcing it into the upper part of it while steam is being injected only into the upper part of the said vessel, and on the top of the goods, whereby, while the bowking liquor is being thrown on the top of the mass of goods, the steam is constantly and simultaneously made to press upon and pass into and through the goods, and facilitate the action of the bowking liquor, and its passage through the cloth, as stated.

[What is the difference between this plan and that of the closed kiers, for clearing Turkey-red goods—the closed vomiting boiler? We can see none.—ED.]

FENCES—By Hervey S. Ross, of Cincinnati, Ohio: I claim the zig-zag and interlocked arrangement of panel, supported by a swivel-joint to posts at suitable intervals, and having the joint between the two middle pannels furnished with inclined hook and eye, each of said middle panels being provided with boards sloping in opposite directions, so that by the action of a flood, each half of the intervening line of panels may separate midway and swing in direction of the current, or devices substantially equivalent.

BOOT JACKS—By Samuel B. Sumner, of Grantville, Mass.: I claim the application to an instrument for taking off boots of the side bars, B, the shaft and the bar, D, arranged and operating in the manner as described.

CUTTER HEAD FOR MOULDING MACHINES—By Josiah M. Smith, of New York City: I claim the combination of the slotted supporting flanges, or their equivalents, with the chisels hinged and operated as set forth.

WORKING THE VALVES OF STEAM ENGINES—By Richard H. Townsend, of New York City: I claim, first, the combination of a cam and eccentric by means of the sector or its equivalent, to operate on the valve or parts that move the same, and cut off or work with the full pressure by the eccentric, according to the position of said sector, as described.

Second, I claim adjusting the position of the sector by means of the governor through the screw, or other suitable means, whereby the governor regulates the position of the sector to communicate the desired motion to the valve of the engine from the eccentric or cam, or both, according to the power required from the engine, as specified.

Third, I claim the rod and points to take motion from the block at its extremes of motion, and communicate the same by means of the right angle lever to the throttle or stop valves, as specified.

MANUFACTURE OF PLAIN AND FIGURED FABRICS—By Frederick W. Norton, of Lasswade, Great Britain: I do not confine or restrict myself to the precise details or arrangement which I have had occasion to describe or refer to, as many variations may be made therefrom, without deviating from the principles or main features of my invention.

I claim, first, the manufacture of woven fabrics by cross-weaving, by carrying the cross warp alternately over a stationary warp, and binding the cross-warp on each side of the stationary warp by a shot of filling.

Second, carrying contiguous movable cross-warps over and across each other's path, and over one or more stationary warps, and binding said cross warps to the stationary warps by shots of filling.

Third, the manufacture of ornamental fabrics by cross-weaving elongated printed warps, as described.

HANGING MILL SAWS—By James Rankin, of Detroit, Mich.: I claim the arrangement of an air chamber, cylinder, and valve, as described, for the purpose of straining saws in motion by the elastic pressure of compressed air, or its equivalent.

SCREW FASTENINGS FOR BOOTS AND SHOES—By John Chilcott & Robert Snell, of Brooklyn, N. Y.: We claim the combination, as described, of two screws, of which one forms a nut for the other, and will hold it secure until it is all worn away.

LARD LAMPS—By L. A. Stockwell, of Batavia, N. Y.: I claim the combination of a reservoir of a lamp for burning lard or tallow, with an outer covering so arranged as to form an air chamber surrounding the reservoir, in the manner described.

RE-ISSUE.

FANCY POWER LOOMS—By William Crompton, of Hartford, Ct. (assignor to Merrill H. Furbush & Geo. Crompton, of Worcester, Mass.) First patented Nov. 25, 1837; extended April 9, 1851: re-issued Sept. 13, 1853: I claim first, the jacks with hooks or projections thereon, capable of being taken or passed by the lifter and depresser, as required, in combination with the harness or heddles, for the purpose of opening the shed.

Second, the combination of the jacks, constructed and arranged as described, with the lifter and depresser.

Third, the combination of the pattern chain or cylinder with the jacks, constructed as described.

Fourth, arranging and connecting the lifter and depresser which operate the jacks in such a manner that they shall operate simultaneously to elevate and depress the jacks and warps in forming the shed, as described.

Fifth, giving motion to the pattern chain or cylinder, as described.

Sixth, the combination of the pattern chain or cylinder with the jacks, lifter, and depresser, as described.

Seventh, so constructing or arranging the lifter and depresser, and the hooks or projections on the jacks, with reference to each other, as set forth, as to bring the upper warps all into the same plane, and the lower warp all into another, when the shed is opened.

I do not claim broadly the bringing of the warps into said planes.

Eighth, connecting the hook jacks to the bottom treddles or levers, by inclined wires or their equivalents, to hold the jacks against the tubes or bars of the pattern cylinder or chain, when not thrown out by the rollers or other projections thereon.

ADDITIONAL IMPROVEMENT.

WINNOWERS AND THRESHERS—By Geo. F. S. Zimmerman, of Charlestown, Va. First patented Feb. 8, 1853: I claim constructing the suction pipe or tube, of any desired form, with a sliding hinged flap bottom, attaching said tube to the side of the thresher or winnower in any position, and also attacning said pipe or tube to the grain discharge or bagging spout, having a sieve-like or reticulated bottom, and using said attachments in combination, for the purpose of cleaning and chaffing, or double winnowing grain of all kinds, with a blowing blast of air and a suction draught or current of wind, also in combination, and in one operation, and at the same time, as set forth.

I do not, however, claim inventing or originating the double cleaning of grain, but simply the peculiar combination mentioned.

[For the Scientific American.]

Steam Boiler Explosions—Lieut. Hunt Criticised.

In the "Scientific American" of the 3rd inst., you published an abstract of a paper by E. B. Hunt, U. S. N.; to me the whole article is extremely illogical and "quantitatively" unmeaning. He says that "perfectly deaerated water, with a limited surface, would not boil," &c. This statement hardly needs a contradiction, for perhaps there may not be one in a thousand but knows that as perfectly deaerated water as we can get, boils as readily as any other, and in a vacuum boils at 140 degs. less temperature than in the open air, and under certain circumstances it may be boiled by the application of cold to the out side of the boiler.

Lieut. Hunt makes it essential to an explosion that air bubbles or aerated water be thrown into the boilers, and in his explanation he says the boat stops at the wharf; the "doctor" or pump supplying the water to the engine (a new feature in making steam) being worked by the engine itself, stops the water supply when the engine stops; the water in the boiler then goes on boiling until all the air bubbles are boiled off from the water &c. &c. Again in connection he says, the engineer then starts the engine; this starts the pump, which throws a stream of air charged with water, directly into the glowing fluid. Then comes the terrific consequences &c.

Now Messrs. Editors if this is an explanation, the result must be uniform; it must be infallible, and every steam boiler pursuing the routine described must and will be blown up. That all are not blown up sufficiently, perhaps, overturns this beautiful theory; but I wish to follow it up a little more closely, for I do not think a document can be found among all the absurd theories which have ever been written in explanation of steam boiler explosions that show more ignorance or want of knowledge of the existing arrangements of pumps, doctors, engines, and boilers now in use on our Western rivers of "tragic reputation" than the article quoted.

The doctors upon the Western rivers are small engines (not pumps) for driving the force pumps to supply the boilers, and are separate and distinct from the main engine, and are never started simultaneously with the main engine.—Very often the doctor may not be started at all; this depends entirely upon the will of the engineer; he must either start it before he goes to the other or afterward; if he should start it before, why the explosion would follow at once, if delayed until after the main engine is started. explosions would not follow so uniformly as they now do at the 2nd or 3rd revolution.

Had Lieut. Hunt said the pumps threw a stream of water charged with air, it would have been a much fairer statement of the case, though without any foundation in fact—for the pump never "throws a stream of air charged with water,' nor even "a stream of water charged with air."

Taking all the steamboats upon the Western rivers, perhaps 700 in all, few are without doctors, and so few as to be of little moment in the examination of the subject. The average capacity of the forcing pumps will not exceed 150 cubic inches at a single stroke; now then, giving every latitude to Mr. Hunt's premises, what will be the proportion of air contained in this water? It is less than 4 per cent, or 6 cubic inches; now this is injected into the remotest corners of the water in the boilers, which average, on each boat, about 1,600 gallons, or, in round numbers, 500,000 inches of water against 6 of "air bubbles;" at this rate these air bubbles are agents of tremendous power, and if they could only be controlled, we have nothing to do but squeeze a "Highland bagpipe" into the back end of a boiler, and any amount of power could be created at pleasure.

The worst of this theory is, that not a particle of air is ever pumped into the boiler in the ordinary running; the truth is, that when the water reaches the pump, in all the western boats without exception, by being passed through the heater, it is very nearly at the boiling point, say 210 degs. Every intelligent engineer knows that this expels the air as effectually as if it were under an exhaust pipe.

This subject of explosions has been mystified quite too much: do not let the true fact be obscured by inexperienced writers;—proclaim the truth, that in ninety-nine cases out of every hundred, explosions occur from negligence of the engineer, in letting the water get low in his boilers. Keep up a good supply of water—place a limit to excessive pressures, and employ competent engineers—are rules of more value than all the abstruse theories that can be written. Show me a good supply of water and I will risk the air bubbles. AN ENGINEER.

Telegraph Batteries.

MESSRS. EDITORS—In No. 46, page 363, I noticed a communication under the head of telegraph batteries; I often wished some one more competent than myself, would take this subject in hand, and as it is now started, allow me to make a short statement as far as my experience goes. I have been an operator on a Morse line for the last four years, and should know something about it. For two years I used Grove's battery, but during all this time I often wished for something cheaper and more convenient, taking out each cup and cleaning it every evening, and again putting it in in the morning, is no small trouble. About eighteen months ago I heard of Olmstead's battery, which is merely a modification of Daniells'; it consists of a strong glass cup holding about a qurrt, into this is placed a cylinder of copper sheeting, then comes a porous cup, and again into this is placed the zinc cylinder. Into the glass vessel is put a strong solution of sulphate of copper, and in the porous cup pure water, some would perhaps add a few drops of sulphuric acid, but this is not necessary. as the acid contained in the sulphate of copper will shortly penetrate the porous cup and action commence. One cup of this battery is nearly equal to one of Grove's, I say pearly, as I do not think it quite so, but the difference is so small that it is of no moment in telegraphing.

The expense of Grove's for a local battery of two cups for one year—

50 lbs. nitric acid at 12 cts. per lb.	$6,25
6 zinc cylinders 25 cts. per piece	1,50
Total	$7,75

Olmstead's, same number of cups, and the same time—

10 lbs. sulphate of copper 10 cts. per lb.	$1,00
2 zinc cylinders 25 cts.	50
Total	$1,50

Balance in favor of Olmstead's, $6,25

This would make in a main or line battery of thirty cups, a difference of $93,75, saying nothing about the mercury which can be entirely dispensed with in Olmstead's Another item is the convenience, there is no taking out the cups every evening and cleaning them, if it is once in operation, all that is necessary is to break the circuit during the night, and it will work for months, merely adding crystals of sulphate of copper when it seems to give way.—Of course the zinc cylinders will have to be cleaned about once a month, and at the same time fresh water placed into the porous cup.—There are no nitrous fumes, and therefore no corrosion at the connections. Perhaps some telegraph operators who are tired of Grove's battery, can benefit by it, and all I have to tell is, try it with a local of two cups, and it will recommend itself. The platina of a Grove's will pay for the whole of an Olmstead's.

Nazareth, Pa., Sept. 10, 1853. C. G. B.

Inventors---Their Rights and Wrongs.

The "Wall Street Journal," of this city, after some censurable remarks on the management of the Patent Office, says:—

"But there are outside influences injurious to the interests of real men of genius, and tending to perpetuate evils in the Patent Office, by destroying sympathy for the labors in the public mind.—Similar causes have been at work here detrimental to the literary class. We allude to the intrusion of pirates, pretenders, and humbugs into every society organized for the purpose of securing adequate protection by law for property in intellectual labor, whether in literature or mechanism. Call a national convention of inventors or authors, and what is the inevitable result? A brazen and impudent pretender rises with his budget of resolutions, or his speech, at every turn, brimful of humbug and himself, and so sickens off men of merit, that they leave the field to the braggadocio and the little circle who may be deluded by his boasts into toleration or support. The folly, the contemptible silliness, the arrogance of some of these universal humbugs who have figured in literary and inventive associations, must even now be remembered with a smile by the members of these bodies.—We appeal to them if their experience does not recur to some Katerfelto starting from his chair at the first pause after organization, and insisting on reading a bombastic series of resolutions, full of sound and fury, or a constitution of a society in which he hopes to be factotum, so utterly complicated and impracticable as to seem as if concocted during a nightmare. These vain and selfish idiots, their insufferable vanity, and the disgust inspired by their presence, have hitherto prevented any concert of action among inventors to effect any good. The same cause has prevailed among authors; in fact, the literary class is morbid, and but very few are unaffected by inordinate self-conceit, which takes the form either of excessive impudence or excessive shyness:"

[The Patent Laws are not yet perfect; there are some reforms required, and these will no doubt be brought about in the way and by the means pointed out by the "Wall Street Journal." The picture drawn in the above of the officious Katerfelto is true to the life. A number of Inventors' Conventions have been held in this city and elsewhere, for the purpose of reforming the Patent Laws, and just such characters have always had too much to say and do with them, hence such conventions resulted in evil instead of good. Honest and worthy inventors have been jostled aside by pirates who pretended to be their friends.

Manufacturing Gold.

M. Theodore Taffereau has laid a paper before the Academy of Sciences at Paris, in which he asserts that he has produced gold by artificial means. He believes that there are very few simple substances in nature, and considers that "the forty metals now assumed to be such are in reality compound ones, probably of one radical with some unknown body, hitherto not studied, but which of itself alone modifies the properties of this radical, and thus presents us apparently with forty bodies, while in reality there is but one." He asserts that he has discovered this body, by which the radical is converted into gold.

[The above we have seen in a number of our exchanges. Mons. Traffereau is no doubt more rogue than fool. He merely revives the old piece of scoundrelism, by which humbug-alchemists cheated so many crowned fools during the middle ages.

New York Mechanics' Institute.

At the regular monthly meeting, on the 13th inst., James Rodges, Esq., Chairman, and Mr. John Tagliube, Sec'y., it was moved, seconded, and voted, that the Institute now proceed to fill the vacancies in its corps of Officers and Directors, and that the ballots should be cast for each candidate separately; whereupon Charles H. Delevan was elected second Vice-President, C. Godfrey Gunther third Vice-President, and Messrs Charles Burdell, Thomas Hunt, C. H. Hankins, and M. C. Tracy were elected Directors.

New Inventions.

Locomotive Spark Arrester.

Edmond Mahony, of Pittsburg, Pa., has invented and made arrangements to secure a patent upon an improved spark arrester, or locomotive smoke stack. The improvement is the construction of a stack, by placing in the upper part of the chimney an inverted cone, within the top of the smoke and steam pipe, which is expanded into an inverted frustum. The base of said cone is also connected with a deflector formed by a frustum of greater inclination, by the action of which the sparks are thrown against the sides of the chimney, whence they are washed away by the steam. Upon the deflector abovementioned is placed a cone, with elliptic sides, the apex of which projects above the top of the chimney. By this arrangement the inventor claims a great increase in the draught of the fire, which object is further sought to be obtained by the employment of a flaring ring surrounding and near the top of the chimney, within which the current of air generated by the motion of the locomotive will rise and aid the escaping smoke in its ascent. The inventor also claims that the peculiar arrangement of the inverted cones will, to some extent, obviate the disagreeable noise common to all high-pressure engines, and, by the increased draught, will save two-thirds the fuel, and, at the same time, increase the power. If so, this is one of the most valuable inventions we have noticed for some time.

Improved Root Cleaner.

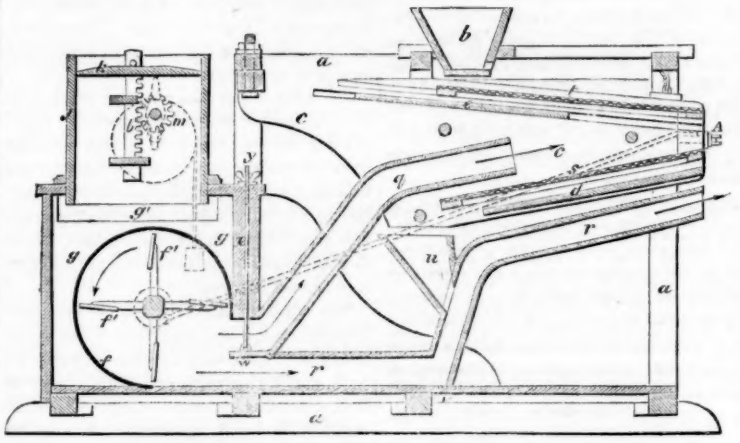
J. H. Fairchild and S. Richardson, of Jericho, Vt., have applied for a patent upon an improved root cleaner. The machine consists of two inclined revolving cylinders, the one within the other, the outer being solid and the inner slatted. Between the two there is a spiral slat so constructed that the dirt will, by the revolution of the cylinders, be collected, carried forward to one end of the machine, and discharged separately from the roots.

Improved Grain Winnowing Machines.

The annexed engraving is a central longitudinal section of a grain winnowing machine, for which a patent was granted to Samuel Canby, of Ellicott's Mills, Md., on the 28th of last Dec. The object of this improvement in such machines is the adjustment of the blast of air to the shoe of the fanning mill, so as to save the grain and not have it blown away by its accidental discharge along with the lighter refuse, whenever the blast is in excess of its ordinary rate, by an increase of velocity. There is also a device placed under the control of the operator, which enables him to vary the distribution of the blast to different portions of the apparatus, according to the nature of the grain to be cleaned; the arrows show the direction of the current of air.

a is the frame; *b* is the hopper; *c* is the shaking shoe; *d* is the conducting board.—These parts do not differ materially from those in use; *e* is an adjustable conducting shelf beneath the riddle, *t*, by means of which the grain, when light and dry, is delivered from the riddle on the screen near the rear end thereof, to prevent the grain being carried off with the light matter, and when the grain is damp or otherwise heavy, so as to require a great amount of winnowing action, it is delivered on the screen, *s*, near the front end thereof. This is done by drawing the board, *e*, in or out. The shoe, *c*, is hung to the frame in the usual manner, and is vibrated by means of a bell-crank attached to a rod (not seen) connected to the fan shaft. The fan case, *f*, is enclosed in a chest, *g*. This chest serves as a channel to conduct the air to the fan, *f'*, from valve boxes which are furnished with butterfly valves. The two valve boxes are placed one on each side of a larger one, *j*, which is like them, open below the chest, *g*. In said box is a piston, *k*, whose rod, *b*, has a rack on one side, into which gears a pinion, *m*, whose shaft is identical with that of the butterfly valves. This shaft extends at one end outside of the valve box, and has a pulley on it over which hangs a cord having a weight hung upon it. This pulley is so arranged with a slot in its side, as to be set eccentrically so as to increase at pleasure the leverage of the weight. In either end of the chest, *g*, above the drum or fan case, *f*, there is an opening, *g'*, which communicates through end chambers, *g''*, with the open ends of the fan case. The action of the weight spoken of on the eccentric pulley,

CANBY'S GRAIN WINNOWER.---Number 1.

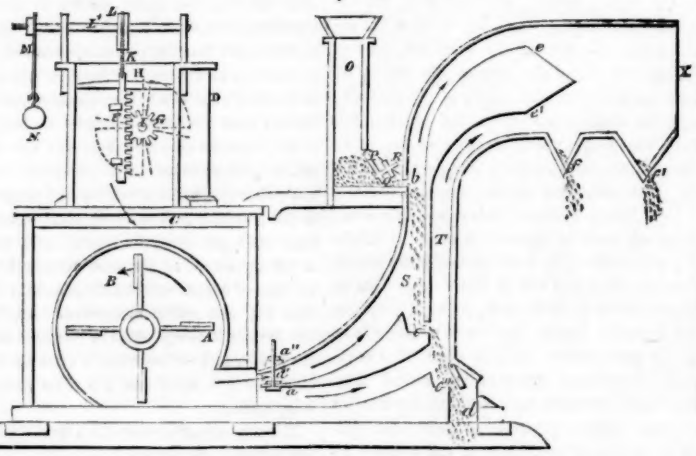


the fan and pressure of the atmosphere upon the piston, *k*, on the one hand, and the resisting weight upon the other, which increases as the weight is lifted, so that should the speed of the fan decrease, the tendency of the weight is to cause it to ascend. The action of piston, *k*, therefore, governs that of the butterfly valves in opening and closing the area of the boxes in which they are placed, and consequently regulating the admission of the air to the air chest, *g*. By a proper arrangement of the eccentric pulley spoken of, the butterfly valves can be rendered very sensitive to regulate the blast.

From the fan case, two spouts, *q r*, proceed, the one, *q*, leading up between the screen, S, and the riddle, *t*, of the shoe, so as to direct the blast centrically between the two, and the spout, *r*, taking a lower course and discharging below the shoe. The object of spout, *q*, is to direct the blast from the fan, so as to carry off the main bulk of the cheat and other light matter, from the descending grain at the front of the shoe. The grain descending from the lower edge of the screen into the hopper, *u*, passes into the spout, *r*, and escapes through the aperture, *v*, in the floor. In its descent through the escaping blast of the spout, *r*, the said blast carries up all the lighter particles and discharges them at the forward extremity of the spout.—To adjust the force of the blast in either spout, there is a flap valve, W, hinged at the joining line of the spouts and fan cases which is operated by a rod, X, having a screw, Y, for working it.

holds the valves open by ordinary velocity, but when the fan has been revolved with a rapidity that will cause a partial vacuum in the chest, *g*, it is evident that the piston, *k*, will be forced down in its box, *j*, to a distance depending on the relative forces derived from the suction of

CANBY'S GRAIN WINNOWER----Number 2.



The annexed engraving is a longitudinal vertical section of a Grain Winnower, for which a patent was granted to the same inventor, Samuel Canby, on the 9th of last month, (August.) The first part of the improvement is similar in some respects to the one embraced in the foregoing illustration and description, and consists in constructing above the fan chamber and the opening into it, a regulator, consisting of three apartments, the sides of the exterior containing openings for the admission of the air, the central apartment being furnished with a piston suspended by a cord passing over an exterior pulley and balanced by a weight at the extremity of a lever attached to the shaft of the suspending pulley; the underside of the piston being attached to a rack rod meshing into a pinion upon a shaft extending across the three apartments, and thus operating two valves in the exterior chambers, and upon the same shaft as the pinion, so that the accurately balanced piston, shall open the air passages as the blast is weakened. or diminish their extent when the blast becomes too strong. The second part of the invention consists in arranging, in the front part of the hopper, a swinging door which shall cause the grain to distribute itself evenly over the bottom of the hopper before raising the door and passing out, thereby causing the grain to flow in a uniform current into the first blast channel.—The third part of the invention consists in passing the blast through two channels, so arranged that the uniform current of grain entering the first, shall, after being acted upon by the blast, pass steadily into the second blast, where the cleaning is completed. The amount of blast into the several chambers is regulated by a swinging door at the entrance of the channels, so as to divide the blast according to the required amount of air for each channel. A is the fan made to revolve in chamber, B, air being admitted through the passages, C, at the ends of the chamber, which passages communicate with the interior of the regulator, D. This regulator consists of three apartments, (the figure being taken through the central one, the two side ones are not shown.) In the apartments—one on each side of D—there is an opening in their sides through which air passes to the fan. In the central apartment is the piston, H, suspended by the cord, K, passed over the pulley, L. On the underside of the piston, H, is the rack-rod, F, which meshes into the pinion, G, upon shaft I. On the same shaft close to the sides of the side chambers are valves which can be made by the revolution of the shaft, I, to cover the side openings altogether or partially. The arrangement of suspending the piston, H, and having it balanced by a weight, N, sufficient for the strength of the blast required, renders said piston extremely sensitive to the least variation of the blast, causing it to regulate the supply of air in a very desirable manner.

O is the hopper having a swinging door, P, upon the exterior of which is the screw, Q, and weight, R, movable upon it. The object of this arrangement is to confine the grain when thrown in the hopper until it has spread evenly over the bottom, when it will gradually raise the door, P, and pass out in an uniform current.—The weight, R, regulates the resistance to the weight of the grain. The winnowing portion of the machine is divided into two channels, S, and T, the amount of blast to be thrown into each being regulated by the swinging valve, *a*, which is operated by the screw, *a'*, and the nut, *a''*.

Operation.—The weight, N, is first regulated to the amount of blast required, and the one R, is also adjusted to the weight of the grain in the hopper, besides which the valve, *a*, is arranged so as to divide the blast according to the nature of the grain. After these preliminary adjustments, the machine is set in motion and the grain is thrown into the hopper, O, the door, P, will prevent its sudden rush out, and cause it to spread evenly, over the bottom of the hopper, forcing up the door gradually, when it will descend uniformly through the aperture, *b*, into the passage, S, where it meets the first blast, which passing through the uniform stream of grain, carries off the light impurities, allowing the grain to fall upon the shelf, *c*, whence it passes in a regular stream into the channel, T, receives the second blast, which drives off in the direction of arrow, whatever light substance it may then contain, the grain falling completely cleaned, on the shelf, *c''*, whence it passes through the opening, *d*. After this separation has taken place, and the light substances are blown off in the direction of the arrows, the full force of the blast is felt until the points, *e*, and *e'*, of the channels, S and T are reached, when by reason of the widening of the mouth of the spout, the blast is weakened, which causes the heavier particles to fall through the openings, *f f'* and the lighter passes out of the mouth, X.

Regulator.—The air passes through the openings, F and C, to the fan, A, which, as it revolves, creates a partial vacuum in the central chamber, D, giving the piston, H, a tendency to descend because of the atmospheric pressure on its outer surface; this inclination is counteracted within the proper limit by the weight, N; but when the blast becomes too great by an increase of the fan's velocity, the vacuum below the piston becomes more perfect, which causes the pressure on the outside surface of the piston, H, to overcome the gravity of N, and depress the piston; this actuates the pinion shaft, I, and moves the valves which regulate the blast into the openings of the side chambers as described before, so as to admit no more air than is requisite to regulate the proper and uniform amount, thus the equilibrium of the blast is maintained under different velocities of the fan, a very important regulation, especially when animal power is employed to drive the machine. When the fan moves slowly, the upper surface of the piston is relieved from pressure, which allows it to rise, and thereby the inlet passages are opened fully to admit a blast that does not expand when it gets inside of the machine. The weight, N, is variable for regulating the strength of the blast for different kinds of grain, and for the perfect regulation of the machine, so as to let none of the grain pass out with the lighter matters at spout, X. The shelf, *c''*, causes the grain to bank open the valve, so that air is prevented from passing out with the cleaned grain. The claim for this improvement is as follows: "the construction of the receiving and discharging passages for the grain, that is the passages at door, H, passages, *c* and passages *c''*, in the manner and for the purpose set forth." The regulating of the blast by the operation of the piston, H, opening and closing the inlet passages according to the velocity of the fan is embraced in Mr. Canby's first patent.—By the two improvements a very perfect winnower is thus produced.

For information about rights, &c., we refer to an advertisement on another page of this number.

Scientific American.

NEW YORK, SEPTEMBER 24, 1853.

How to Observe.

During the next month we will have two industrial fairs in this city, namely, the Crystal Palace Exhibition, and the Fair of the American Institute at Castle Garden. Tens of thousands of our countrymen will be here for the purpose of visiting both of these places. The American Institute has never done anything worthy of its name, and never will while it continues to be managed as it has been; the only benefits derived from it have been from its yearly fairs, like those of other mechanics' institutes in our country. Such exhibitions of industry do good by the competition which they engender among manufacturers and mechanicians, and by the advantages for observation and comparison presented to those who visit them and examine for improvement to themselves; to such we would address ourselves, especially our young mechanics.

There is certainly great pleasure to be derived in seeing beautiful machinery operate, even without understanding how its various motions are produced, or by what particular means the iron hands can spin, weave, print, make nails, &c., but how infinitely higher is the pleasure derived when all the motions of spindle, shuttle, cylinder, &c., are known and understood,—how they are made to move in strict but dumb obedience to the genius that arranged and gave them direction. Every mechanic, therefore, who visits an industrial exhibition, should not be satisfied with the mere pleasure derived from seeing the machinery in motion, or the mere skill displayed in its execution. No, he should endeavor to gain a knowledge of "the why and the wherefore of their operations," and unless he does so he cannot observe to profit. It is not enough that a mechanic of a certain trade should observe all things exhibited which belong to it, though these should claim his attention first. He should endeavor to know as much as possible about everything. He does not know but he may be able to suggest and invent an improvement in a machine, the farthest removed, it may be, from his own trade and calling; this hint we would desire to impress strongly, not only on the minds of young mechanics, but upon the mind of every man who has the least taste for invention. Many, yes, the majority of the most important inventions which have been produced, were by men whose occupations in their nature, were very far removed from the inventions which they produced. The inventor of the throstle spinning frame was a barber; the inventor of the power loom was a clergyman; Fulton was a painter and engraver; Whitney was a teacher; Morse, the inventor of the telegraph, was an artist; and the inventor of the neatest sewing machine in the Crystal Palace was reared a cabinet maker. We might adduce a great many more of such cases, but these are enough for our purpose. Had these men not observed correctly, they never would have lived to accomplish any good thing, and had they been imbued with the foolish notion which is commonly expressed in the vulgar sentiment, "let every man stick to his trade," they never would have gained such honors as they have extorted from admiring millions, nor left their names so deeply notched "upon the walls of time."

It is an excellent plan for young men to keep note books, in which to record their observations, and take sketches, if required. It is not wise to depend on memory altogether, especially in industrial exhibitions, where there is such a variety of different objects, both to attract and distract the attention. It is only one man out of ten thousand who possesses strength of memory, arrangement, and concentration of mind to classify and remember all that he has seen and desires to carry away with him from such places. It is surely wise, then, to have a record at hand to refresh the memory and bring forgotten things to recollection, especially complicated machinery with its various motions. We have thrown out these few remarks in order that they may be the means of leading mamany to observe wisely and well.

Southern Mechanics.

The progress of improvements in mechanism, in our Southern States, during the past few years, has been very rapid and creditable to our Southern mechanics. A powertul mechanical genius is universal among our people, and is not confined to any one section or State in our country. The beautiful steam engine in the Crystal Palace, from Montgomery, Ala., affords a striking example of the mechanical skill, displayed in some of our Southern machine shops; and the Planetarium of Mr. Barlow, of Kentucky, is perhaps the most ingenious, beautiful, and philosophical piece of mechanism in the Exhibition. We have had the pleasure of obtaining a great number of patents, for Southern inventors, during the past five years, and can, from this, and also from our extensive correspondence, bear witness to the activity of invention among our Southern mechanics. When we take up the map of our country, and look upon the wide expanse embraced in the States of Virginia, Georgia, the Carolinas, Alabama, Missouri, Tenessee, &c., and when we reflect upon the magnificent natural resources of these States—the future looms up big with greatness and grandeur for them, in view of what our Southern mechanics have yet to achieve.

Our Northern States, with the exception of Pennsylvania, have less natural advantages for manufacturing purposes than our Southern States, yet they have more experience, and this is a great advantage. Within the past few years, however, a very active manufacturing spirit has been kindled in the South, and many of the best northern mechanics have taken up their abodes and made their homes in a warmer clime. These mechanics are all reading men, and their children will be an intelligent race after them. The influence of intelligent mechanics in any place is of the first consequence to its growth and prosperity.

Patents in Canada—Congress.

After copying our late remarks respecting colonial patents, "Mackenzies' Message" asks:—

"Why does not the "Scientific American" begin by recommending to Congress to reduce the fee charged at Washington on a patent to any foreigner in the United States? The fee payable by an American is $30—by any other countryman than a British subject $300—by a Canadian $500. We drew up a very full review of the patent laws in 1851, in the shape of a bill, but abandoned it on perceiving the personal feelings of the ministry."

In the very article copied into the "Message," we advocated a reduction of our patent fee "to all stated residents in the colonies." So far as the English American colonies are concerned, we would like to see established a mutual system of patents, as our interests with them are becoming mutual and very important. On all suitable occasions we have urged upon Congress to abolish the present miserable discrimination between English subjects and all other foreigners, but we cannot consent to invite foreigners to take patents here upon the same terms as though they were citizens of the United States, so long as their own governments continue their present high fees. It would not cost much labor to prove the present system in vogue abroad much more than a genteel method of swindling honest inventors—in England especially. The United States Congress graduated the patent fee in proportion to the charges of other governments; thus John Bull received the full force of that excellent maxim, "such measures as ye meet, it shall be measured unto you again," and now we suppose we cannot look for a change even though the English fee has been reduced. The fact is, our legislation is under the control of windy, ignorant, time-serving, spoils-grabbing, brawling politicians, who care little and know less of the real wants of the nation, and regularly blockade every attempted reform. What has our Congress done for the mass of inventors since 1836—nothing—and every attempt at change in the patent laws has betrayed an ignorance and stupidity in Congressmen upon this subject of which almost any reader of the "Scientific American" would be ashamed. So long as money-making, wire-pulling, and galphinizing is the end and aim of our law makers, we despair of any progress except on the road to national ruin. We are out of all patience, and have no confidence in public legislation; it amounts in plain language to a blotch, a grease spot upon the history of this country. Our business is not to quarrel with public men, but we have so long and earnestly sought for some change in the patent code—and have done so in such tender and supplicating terms without effect, that patience has ceased to be a virtue. If not thought unreasonable, we would again treasure up a small hope that something might be done for inventors during the next session of Congress.

Railway Improvements.

"A patent has been taken out in England for semi-tubular wrought and cast iron transverse sleepers for railways. Many advantages are claimed for the iron over the wooden sleeper, and it is presumed that iron sleepers can be used at less than half the cost of wooden sleepers.

A substitute for the railway turn table, an English invention, is on exhibition at the Crystal Palace.

A correspondent of the 'American Railway Times' suggests that mortality by railroad collisions would be lessened, if all the cars composing a train were made into one car—in other words, let the whole train consist of but one long car, to contain passengers, baggage, &c., and to be so constructed as to be flexible, adapting itself to curves."—Ex.

[The tubular iron sleepers may be cheaper than wooden ones in England, but not in America. A system that might be economical in one country would be expensive in another.

We have examined the turn-table mentioned above, since our correspondent noticed it among articles in the Crystal Palace, a few weeks ago, and have found it to be a contrivance long used on some of our railroads in this country. The correspondent referred to, who proposes a long flexible car, to lessen the mortality of railroad collisions, no doubt had his mind fixed upon india rubber—it is the very thing desired. The fact is, however, that the length of cars, for safety, on any railroad, must correspond with the curves on the road: the greater the curves the longer can the cars be built—every scientific engineer knows this. On a railroad having many short curves, long cars are dangerous, yes, and short ones too. For safety, the fewer curves, the better, and none of these should be short. The only effectual remedy for railroad collisions is in double tracks. The genius expended in devising other means than this, to prevent collisions, is a waste of mind. More genius has been imprudently expended on railroad improvements than on any other class of inventions. How many plans have been devised for keeping out dust, and for proper ventilation, all of which could be more effectually obtained by means well known, and of a more economical character. Thus, to prevent dust getting into the cars, the best way is to have no dust upon the tracks—this is not an impossibility, but something easily accomplished. The sparks from the locomotive can be avoided by abandoning the use of a fuel which causes sparks; this also is not an impossibility. A fuel can be obtained which neither produces smoke nor sparks; let it be used in place of wood. We really do not see, how it is that so many prefer to deal in complex remedies for evils, when more simple ones can be applied and with more lasting effect. It appears to us that too many of those gentlemen who are engineers and superintendents of railroads, do not appreciate simple remedies for railroad evils.

The Wave-Line of Ships—Old Fogy Periodicals

The "Tribune" of Monday, the 12th inst., published a long article on the superiority of American ship-builders, taken from a magazine of this city, devoted to Engineering, and published two weeks ago. The re-publication of this article now, after it has been published more than fifteen months ago, is a forcible illustration of the enterprize and intelligence of some of the New York press in such matters. The whole article, as copied by the said magazine, and by the Tribune from it, will be found, along with some more interesting matter taken from Scott Russell's Lecture, on page 280, Vol. 7, "Scientific American." The "schoolmaster has been abroad," but then how can he help having dull scholars? If such periodicals had eyes to see they would not, in 1853, be living in 1851,—but thus it is, some men sleep like old "Rip," and fancy all the world has been sleeping like themselves.

New Steamboat Law—Revocation of a License.

The Inspectors of Steamboats for this district have revoked the license of Washington Haws, the Chief Engineer of the "New World," for neglect and carelessness as to the cause of the explosion of the flue of the boiler of said boat in the month of July last. This engineer was hurt by the explosion, and the Inspectors delayed their examination and report on that account until the 12th inst. This steamboat had three syphon gauges, none of which were in order; one of the safety valves was also out of order. The inspectors, John M. Weeks, and Henry B. Renwick, decided that the boiler gave out in consequence of an over-pressure of steam. In their report they state that ninety steam vessels have applied for inspection and of that number 50 have received attention.

We are glad to see the Inspectors doing their duty. The New Steamboat Law is very severe; let them execute it with fidelity, and steamboat accidents will become very rare. Let them not forget that constant vigilance is required. We feel grateful for this law, as it has been the means of preventing many accidents already, especially on our western waters. We regret exceedingly that our present government made a political matter of it, in removing the inspector who originated and spent so much time and money in having it passed. Will the time ever arrive in our country when party feelings will give place to those of pure patriotism?

Trial Excursion.

On the 15th inst. an excursion was given on the Hudson River R. R., for the purpose of testing a plan for the prevention of dust, smoke, and the noise of car wheels, and also for the trial of the saloon cars, mentioned by us a few weeks since. To attain the former object, the space beneath the cars was enclosed by panels suspended from the sides of the cars and reaching a little below the upper surface of the rail. Mr. Salisbury, the inventor, proposes to make these panels double, and to fill the space between them with some fibrous substance, to deaden the noise. There is also a second platform beneath the car platforms, to prevent the dust rising between them. The inside of these panels, and the bottom of the cars are to be fire-proof, and the smoke from the chimneys is to be turned into the passage thus created beneath the cars. We are glad to see the Directors of railroads waking up to this subject: the dust and cinders of trains travelling in dry weather, are an abominable nuisance, and among the various plans proposed of late, we think some one might be found which, if fairly tested, would, to a great extent, be successful. We regret that other duties prevented us from being personally present on the occasion.

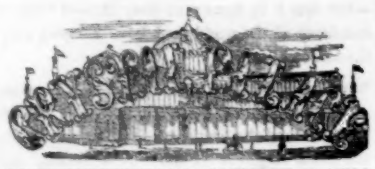
Our Prizes—To the People.

We would earnestly solicit those who are endeavoring to obtain subscribers and clubs, to send in their names as soon as possible, in order that they may obtain all the back numbers, and so have complete files of our new volume. We are gratified with the immense number who have already become subscribers; our old friends have promptly sent in their subscriptions, and new friends have come forward in unprecedented numbers to subscribe for the cheapest mechanical paper in the world.

To Keep Gum Arabic Sweet.

We have received a letter from a correspondent asking us if we know how to keep dissolved gum arabic sweet in bottles, so as to prevent it from fermenting. He receives it in bottles from England, and it keeps perfectly sweet. Alcohol would keep it perfectly sweet, but then it will not dissolve it; water must be used for this purpose; perhaps the English usea small quantity of alcohol after the gum is dissolved. A very minute quantity of alum water is used in dissolved gum arabic by those who employ it in England for dressing fine silks.

We shall commence next week the publication of a brief series of articles upon the so-called "imponderable agents." In these we shall review the prevailing theories, and shall propose the outlines of a new or modified theory for the consideration of our readers.



THE CONTRACTORS AND MECHANICS' DINNER TO THE CONSTRUCTING ENGINEER OF THE CRYSTAL PALACE, C. E. DETMOLD, ESQ.—On the evening of the 13th inst. the principal mechanics and contractors engaged in the erection of the Crystal Palace, gave a Dinner in honor of C. E. Detmold, Engineer to the Crystal Palace Association. The company, to the number of about 70 persons, sat down to the entertainment; Mr. Delamater of the firm of Hogg & Delamater, presided.

Dodworth's Band was present, and discoursed music during the evening. The table was beautifully and appropriately decorated. The most appropriate of the ornaments was a miniature representation of the Crystal Palace. This was located immediately in front of the President of the occasion.

This dinner was got up and given on account of the Directors neglecting, at their Dinner, given at the opening of the Crystal Palace, to recognize the claims of the mechanics who planned and erected the edifice. This banquet went off much better than the one given by the Directors, notwithstanding there were no golden epaulets or ostrich-feathered gentry present.

Mr. Detmold made a speech when his health was drank, of which the following is the substance:—

"Gentlemen; All of us may point with just pride to the structure which we have reared on Reservoir square; it fulfills nobly the purpose for which it was designed, and it is a gratifying fact that, amid all that has been said and written of the Exhibition, the building itself has not only been always exempt from censure, but it has invariably been spoken of in terms of unqualified praise.

There is, however, one point in connection with it that has caused disappointment to the public here and abroad, and mortification to the Directors of the Association. I allude to the non-completion of the building in time for the promised opening of the Exhibition on the 2nd May, 1853."

On two public occasions the Directors by an extraordinary omission, have been the means of creating an impression that the disappointments arising from not having the Palace open at the time appointed, was the result either of imperfect arrangements for the execution of the work, or a want of sufficient energy in urging its progress.

No doubt, gentlemen, it is to this extraordinary omission on the part of the Directors to make any reference whatever to the builders of the Crystal Palace, that is due, in some measure, the very handsome compliment with which you have honored me this evening.

It can only have been from the misapprehension of the facts, or the character of the difficulties which have attended this undertaking, that the Directors of the Association could have felt themselves justified in leaving me, by their pointed silence, in a position before the public which makes a reference to my connection with the building necessary.

My connection with the Association for the Exhibition of the industry of all Nations, dates from August 11, 1852. Up to that moment I had no knowledge of it whatever, except in a general way.

The project itself had been conceived as early as the Autumn of 1851, immediately after the close of the great London Exhibition. In March, 1852, a charter had been obtained from the State of New York.

And on the 12th July, 1852, the Board of Directors had formally announced to the world that the Exhibition would be opened on the 2d of May, 1853. Meanwhile they had collected eight or ten different designs for an Exhibition Building; most of them, however, were architectural sketches, rather than definite plans. But the Board shrank from the responsibility of making a selection.

It was at this critical junction that I consented on 11th August, 1852, (just one month after their announcement that the Exhibition would be opened on 2nd May, 1853,) to accept the arduous and responsible post of Superintending Architect and Engineer, on condition that I should be authorized to advise upon all professional questions with Horatio Allen, to which the Board most readily consented.

The first duty that devolved upon me, after entering into the service of the Association, was to select from the several designs in their possession one that should meet as far as possible the requirements of the proposed Exhibition, and the circumstances in which the Association had been placed.

In the report upon the Designs submitted by me to the Board of Directors on the 26th of August, 1852, after establishing the chief conditions that should be satisfied by any design adopted, I said:

"In applying these cardinal conditions to the plans before me, I regret to say I find no one that satisfies them all; but the one that comes nearest doing so is the design of Messrs. Carstensen & Gildemeister.

As to the estimated cost, and especially as to the important point of timely completion of the building, I said in my Report that the plan recommended "presented no greater difficulties than any other, except that of Messrs. Bogardus & Hoppin."

I had thus brought clearly to the view of the Board, which of the established conditions were and which were not fulfilled by the design of Messrs. Carstensen & Guildemeister, but the Board accepted it unhesitatingly, subject to all its uncertainty as to time and expense.

No sooner was this design adopted than its execution was begun in good earnest: the progress of the work was urged by me, through all seasons and all weathers, and by day and by night, whenever and wherever night work could be done with advantage.

Nevertheless it is due to myself to state that want of working drawings continued throughout the entire construction of the building, and was a constant source of deep anxiety to me; and as early as November 18, 1852, I had made it the subject of an earnest communication to the Board, in which I represented fully the effect it would have upon the completion of our building.

In the next place it is proper to state that the anticipation that the larger foundries (of the country) would co-operate extensively in this work, were not at first realized; and it was only by an extreme subdivision of the contracts that I was enabled to secure the execution of the work in any reasonable time.

Another circumstance not anticipated by any one, and which operated most unfavorably upon our work, was the extraordinary advance in the prices of iron. The great bulk of the work had to be put together and erected during the rigorous winter months, in an exposed locality and without shelter.

And yet with all these adverse circumstances, such was the active and energetic spirit of the parties who did engage in the work, that any one, conversant with enterprises of this kind, must concede that the time consumed from the first inception to the completion of the building, needs no apology.

On the 1st September, 1852, nothing was in existence of the building but a mere architect's sketch; and during the nine months following our Crystal Palace has sprung into complete existence, covering four acres of ground, and composed of over 1,500 tons cast iron, and 300 tons of wrought iron.

Now gentlemen, it is not for me to say upon what grounds the Board of Directors announced on July 12, 1852, that the Exhibition would be opened on the 2nd of May following, for at the time of this announcement, I had no connection with the enterprise. Nor does it devolve upon me to explain why they permitted that announcement to remain unchanged. But it is due to myself to state that I expressed myself, as to the time of completion with caution, proper at an early stage of my connection with the enterprise; and so soon as the character of the work and the difficulties attending it began to develope themselves, the President of the Association was fully and constantly apprised by me of the impossibility of having the building completed in time for the promised opening in May, 1853.

I have availed myself of the opportunity which your indulgence has afforded me, to make such a plain statement of facts as will, I think, effectually set at rest the question as to whether the disappointment resulting from the non-opening of the Exhibition on the day promised by the Directors was in any wise chargeable to those intrusted with the construction of the Crystal Palace."

[We have published the above speech for four reasons. First, it is the only account of the delay in opening the Palace that we have seen printed. Second, it informs us that the President was well aware long before the 2nd of May, that it could not be completed by that time, and yet the world was not undeceived in season as to this fact, to the no small discredit of American punctuality. Third, who selected the design. Fourth, that there has been dissatisfaction on the part of the Directors—this we infer only from what was said.

How much the delays were caused by Messrs. Carstensen & Gildemeister, as alleged, not furnishing the working drawings in season, we do not know; these gentlemen have denied that it was their fault. The Directors had probably much reason to find fault in many respects, and we suspect that the blame of the Crystal Palace not being ready on the 2nd of May, must rest on that absent-minded gentleman, Mr. Nobody. The building is a beautiful one, but its selection, we believe, taking all things into consideration, was not judicious. The multiplicity of patterns which appear to have been required for the castings, exhibit a want of clear and simple judgment somewhere.

PRELIMINARY REMARKS.—The machinery in the Exhibition is not by any means all arranged or in working order. There is considerable space yet to be filled up, but since our last number was issued many new machines have been received and arranged. All the space, we have been informed by the Superintendent, Mr. Holmes, has been spoken for long ago, and we may expect to see it all occupied by the first of next month.

GOOD AND BAD.—We must say that with many new and excellent improvements in machinery, there is much that is defective. It appears to us, that with all our light and knowledge, there are many who live in the dark ages, and prefer darkness to light. This may be owing to the peculiar construction of their minds, they viewing a defect as an improvement, just the same as the Hindoo laborer, who prefers to carry his earth in a basket and cannot be persuaded that a wheel barrow is a superior mode of transporting it from one place to another in making roads. There is much in the Exhibition which (as any who visits it will see) displays a want of scientific information, and betrays a lack of good reading, without which no mechanic can be intelligent.

THE STEAM ENGINES.—The machinery in the Arcade of the Exhibition is driven by two steam engines; there are three such motors in it, which are more conspicuous than all other machines in the Palace. One is a beautiful walking-beam engine, built at the works of Corliss and Nightingale, at Providence, R. I. Another is a a double horizontal engine built at the Lawrence Machine Shop, Mass. It has two cylinders of 15 inch bore, and 35 inch stroke each. The third is a horizontal engine built at the Winter Iron Works, Montgomery, Ala. These engines are well made and of beautiful construction. When they are in operation, a lofty and sublime idea of the power of steam is impressed upon the mind. Ignorant indeed of the steam engine are those men who have, within a few years past, in this city—prominent though some of them are for a scientific reputation—decried this useful agent, and who have endeavored to exalt their own ill-digested and contumacious notions above those of the great Watt; their names will be known in engineering story as ignorant blunderers, while his will shine bright through all coming time. Fulton and Watt indeed belong to the past, but Capt. Ericsson does not yet rule the present,—no, Ericsson belongs to the mistakes of the past. Watt rules the present in the Machine Arcade of the Crystal Palace. Every person who visits it feels the full force of this truth. There the beam engine, like a graceful actor with all its parts playing harmoniously, exhibits the perfection of mathematical and artistic skill—the abstract and the concrete are here moulded into beauty and usefulness—the steam engine is the most perfect product of Venus and Vulcan. As the boilers which supply the steam to these engines are placed outside of the building, when they are set in motion, there is something truly thrilling in seeing them start from their slumbers into giant activity. No wonder the poor Hindoo, when he first saw a steam engine set in motion, exclaimed, "he has a spirit within him." When Dr. Page's electric engine was exhibited in this city two years ago, and when, by the mere turning of a key, it was set flying away in a sheet of flame, it extorted rounds of applause; how much more would one of these steam engines in the Crystal Palace extort "cheers repeated" from an audience of the most learned men in the world, if for the first time in their lives it had been set in motion before them. Look, ye shallow panderers to deceptive schemes, at those huge iron arms moving with irresistable power, precision, and velocity, and tell us if they do not present reasons, without debating the question, why the hot air engine, after a place was spoken for it, dared not appear beside these stern apostles of steam.

There are four rotary steam engines in the Crystal Palace: they are all small, and we have not yet been able to learn the name of their authors, excepting those of Ebenezer Barrows and R. C. Bristol, of Chicago, Ill., noticed in the last volume of the "Scientific American." We have not been able to see any of these rotary engines in motion yet, but that of Mr. Barrows is well known to our readers. It was illustrated on page 25, of our last volume, and a larger one than that in the Exhibition propels the inventor's steamboat "Rotary," which is now running as a passenger boat between Newark and Bellville on the Passaic River. The inventor is a man of untiring energy and perseverance of purpose. If he did not think his invention a good one, he is not a man that would say a word in its praise upon any account.

There is also a model of a steam engine on one of the tables, which has the lazy-tongs arrangement attached to the piston rod, and connected with a long crank, in order, as the inventor supposed to get power by long stroke of crank from a short stroke of piston—that is what people ignorant of mechanics call "increasing the leverage to gain power,' as if there were any power in a lever. The lazy tongs has been proposed to us to get a long stroke of a saw from a short stroke of a steam engine, but we discouraged the idea. When will people learn wisdom in mechanical science.

GOLD BEATING MACHINE.—There is one machine for beating out gold into leaf. This has been heretofore considered an impracticable business for machinery, hence it was supposed by many that it could only be accomplished by hand labor. The name of the inventor and patentee is Vine, but it is not the only patent machine for the same purpose in the country, yet it is the oldest. There surely can be no positive obstacles to the accomplishment of any kind of work by machinery when all the work is but a repetition of one process, which gold beating is. The peculiar motions for changing the gold to be beaten have only to be obtained and all the rest is easy. This effect is apparently obtained in this machine; of course it is not possible for us to speak particularly of the work which it produces.

THE LARGEST PAIR OF SHEARS IN THE WORLD.—There is one pair of shears for cutting iron, made upon the principle of Dick's patent, which are worthy a journey from Oregon to see in operation. The jaws are four feet long, and they cut through plate iron of an inch in thickness, as easily as a hungry Welchman (no offence to worthy Taffey) could masticate a piece of cheese. We have seen this machine cutting plates of iron of half an inch in thickness, with great rapidity, and making an exceedingly clean edge, a very important consideration in such machines.

Persons from the country should be careful, when they come to this city, in selecting the proper cars and stages for the Crystal Palace.—Don't get on the wrong cars.

TO CORRESPONDENTS.

P. S., of N. Y.—You will perceive that the same object you propose to accomplish is obtained in the Irving Boiler without the use of a pump. Avoid pumps as much as possible, they are troublesome and absorb the power of the engine.

"Michael Uriocker" will please to inform us how he will have the Lathe shipped. We do not remember his address. $25 received.

W. A. S., of N. Y.—There is one question which must arise, when it is stated that wheels run faster than the water, viz., "how is this?" There is certainly much obscurity thrown around the action of such wheels; we shall soon publish something on the subject again.

A. J. D., of Pa.—James Hamilton formerly lived in this city; we have known nothing of him lately.

J. C., of Vt.—Wm. Kumbel, No. 33 Ferry street, is the manufacturer of leather belting of good quality.

J. McN. of Iowa—Friction rollers have been successfully applied to shafting of all kinds—they are not much used. Your proposed improvement in drilling is desirable.

A. C. C., of Ky.—We positively do not see how your Stave Dresser can accomplish the proposed object; as it is described it will not operate well.

E. C., of Ark.—Gunpowder is composed of five parts of nitre, one of sulphur, and one of charcoal, finely powdered, and very accurately blended.

S. W. H., of Mass.—Mr. Ketchum's plan of increasing adhesion of locomotives on inclined planes, was by means of small driving wheels fixed on the axles outside of the large wheels, and adapted to an angular or wedge-shaped rail laid on the steep grades, and raised above the ordinary rail. You will perceive that it is like yours—it is as old as 1838.

C. W. H., of Pa.—Mr. Bigelow's Loom for weaving coach lace was patented in 1837,—it would be impossible to describe it without the specification and drawings.

R. E., of Vt.—Miner's Safety Fuse is an old English invention; there is no patent for it in this country, therefore you can make and sell as much of it as you please.

C. C. A., of Pa.—It is easier to disparage the efforts of inventors than to invent; you should recollect this.

A. R. E., of Ct.—We have carefully examined your sketches and description, the machine is ingenious, but we fear altogether too complex in its contrivance; it is almost up to Caleb Tompkin's patent, which consisted of "a new and useful application of principles consisting of cross bars, levers, and ends, and cross and single levers, bars, shafts, pieces, tumbling bars, balances, action horizontal, perpendicular, rotary, reciprocating, surface, and central action of lever powers, simpleness, and economy in its useful principles, which has not heretofore been used or heard of." We think you would not succeed with so many items under one combination.

S. A. O., of Pa.—We do not think your press contains any new feature: it is the same as Brown's Progressive Power Press.

T. F., of N. Y.—We do not think your alleged improvement in hand wrenches contains anything new or patentable, and you are advised not to make application.

G. V. A., of N. Y.—We think your case will soon come up, although it is impossible to tell when.

R. W., of N. Y.—We think your reaper possesses decidedly novel features, and we can see no objection to a patent being secured on it.

J. B. A., of Va.—We shall be glad to publish engravings of your machine, as it will very much interest all of our southern readers. We can supply you with Vols. 6, 7, and 8, bound, at $2,75 each.

J. J. S., of St. Louis—Citizens and those who have declared their intention to become such are entitled to the privilege of filing caveats. The order of Judge Mason does not cut off "aliens" who have resided in this country one year next preceding the application, and have made oath of their intention to become citizens thereof.

H. H., of Pa.—Winter-strained sperm oil is the best in our opinion, for lubricating all machinery, fanning mills, as well as steam engines. There is much poor oil sold for the genuine.

A. L., of Conn.—A season ticket to the World's Fair is only for 1853. It has been announced to close in December. It may last for some years: we cannot tell yet.

J. G. B., of ——.—Liebig is still living, but is now in the capitol of Austria (Vienna) having been invited by the Emperor to take up his abode there; he receives a very high salary.

W. J. C., M. D., of Ohio.—We really do not know what advice to give about Mr. B. There is no institution in our country for remunerating the authors of such discoveries. He should present it to the Smithsonian Institute first, as it is a national institution.

K. E., of N. Y.—It would be of service to ourselves if we knew how to keep sperm oil from gumming, and to maintain all its original qualities.

M. B., of Ind.—Neither glass nor porcelain coffins are patentable.

M. C. H., of Ga.—Yours has been received and will meet with attention.

P. B., of Pa.—If you look into any arithmetic, with a section devoted to "gauging," you will find a rule to measure the contents of casks.

W. M. M., of Ill.—The water of the earth is classed with other matter in respect to its gravity.

E. J. M., of Ala.—The proof which you mention would be sufficient to establish your claim against all subsequent inventors.

R. O. D., of Miss.—We are not in a position to accept of your proposition in regard to the balloon scheme.

C. M. E., of Phila.—We do not know of any such person as you allude to.

R. C., of Ohio.—Painting window blinds, see page 236, Vol. 7.

C. J. D., of Mass.—We do not remember any late patent for purifying animal fats and oils. You had better examine the back numbers of the Scientific American.

J. McM., of Ky.—We have carefully examined the sketch of your alleged improvement in paddle wheels,—In plain language, it is an old, bungling, and inefficient contrivance, and was condemned long ago.

J. Y. T., of Ill.—We thank you for the friendly greeting. The raker of Atkins is unquestionably a good invention—we shall publish it soon.

J. S., of N. Y.—You had better submit your plan of a safety passenger car to some practical railroad man, and take advice. We still think it objectionable in point of weight.

E. S. G., of S. C.—The application of a weight to machinery for operating a churn dash, or anything else, is not patentable.

A. B. K., of C. W.—Your plan of steam boiler is new, but we think you would not find it an object to patent here. The self-setting dogs for saw-mills we think well of, but cannot vouch for its novelty—you would have to pay $500 fee. $5 received.

J. M., of Ark.—Evan's Mill Wright is an old work, but good; Tredgold, Scott Russell, or Lardner on the Steam Engine are good works. The American House Carpenter and Tredgold's Carpenter are good works, but we do not know the prices; Appleton & Co., 200 Broadway, sell them we think.

J. S., of S. C.—The best packing for steam pistons is spring metallic. Use gaskin if you have nothing else; some use vulcanized india rubber.

L. G. B., of ——.—A loadstone will attract a piece of iron and make a ball roll on glass when kept at the proper distance from it.

J. C. M. of Pa.—We cannot give you the information you desire about the Aamzon Steamer.

J. S. E., of Md.—Gillespie's work on "Road making" is the one we referred to. We do not know who has it, but presume any prominent bookseller would keep it.

D. B., of Mass.—We simply require a brief description of the operation of your machine, with a statement of the advantages you claim for it over other machines for the same purpose.

M. A. of Miss.—We caution you against purchasing any right in an invention until you know what it is. We presume there is no patent.

L. C., of Miss.—Your specification has been forwarded to the Patent Office, as you will see by referring to the initials under the head of "specifications and drawings forwarded to the Patent Office." There is nothing to prevent your putting your invention into use immediately, as we are aware of; certainly you will in no wise invalidate your patent by so doing, should one issue.

E. B. H., of Vt.—We cannot give the information you desire about the mill until we are furnished with the patentee's name; we do not know to whom you refer.

J. R., of Ill.—We will attend to the examination of the record and ascertain, if possible, the nature of Maloney's Patent.

C. R., of Pa.—We can prepare engravings of your invention and publish them within a few days after the receipt of your Letters Patent. It will benefit you very essentially, as the Scientific American circulates 20,000 copies in the various parts of the country. Inventors ought always to publish their inventions if they are useful and worth the expense, which is very trifling.

H. A., of N. Y.—You are right; having since examined the model referred to by you, we have found that Dunn's is not different from plans well known and used in the United States.

B. M. W., of Tenn.—Yours has been received and will receive attention.

C. A. C., of Md.—You can easily tell what per cent. of fuel is saved by working steam expansively, by making the calculation of your gain by so working it.

W. E. G., of Phil.—You will have an answer soon.

L. W., of N. C.—We would not recommend you to get an engine of less than twelve horse-power for your saw mill. We know an eight horse-power engine will do the work of the carding machines and the saw mill also, but it is best to have plenty of power, and never strain the engine.

E. D. R., of Va.—You are right—Virginia possesses an abundance of the finest fuel, and has natural resources of the very best kind for improvements in agriculture, manufactures, railroads, steamships, &c. The spirit of progress is abroad, and great results may be anticipated in a few years. We would counsel you to purchase an engine of the very first quality. Let it be plain, but strong and well made, and of the best of materials.

D. D., of N. Y.—No man of sense would use a wind-mill to elevate water to turn a wheel, unless it were to take advantage of winds for the purpose of supplying a deficiency of water at some period of the year; in such cases it may be useful.

J. H. C., of Pa.—You ask how far a heavy body will sink in the ocean, and state that you have heard that iron, in some places, will not sink to the bottom. This question we discussed three years ago, and against a number of pretenders to science, showed that a heavy body will sink to the bottom in any part of the ocean. The idea that iron will not sink to the bottom is monstrously absurd. Soundings have been obtained in the middle of the ocean.

Money received on account of Patent Office business for the week ending Saturday, Sept. 17:—

J. C., of Ohio, $55; E. M., of N. J., $20; D. A. H., of N. Y., $60; J. L., of N. Y., $58; L. R. F., of Ga., $10; J. O., of N. Y., $50. J. L. L. M., of Pa., $50; I. W. McG., of Pa., $25; J. W. P., of N. Y., $55; I. M. H., of R. I., $65; E. J. M., of Ct., $50; J. L. G., of Ga., $55; D. A., of N. Y., $30; A. E. B., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Sept. 17:—

L. R. F., of Ga.; J. J., of N. Y.; I. W. McG., of Pa.; A. F., of Ohio; A. J. Jr., of N. Y.; L. C., of Miss.; A. E. B., of N. Y.; E. J. M., of Ct.; J. L. L. M., of Pa.

A Chapter of Suggestions, &c.

Missing Numbers—Mail Subscribers who have failed to receive some of the numbers of Vol. 8, are informed that we are able to supply them with any of the numbers, from 1 to 52, EXCEPT the following, and these we are ENTIRELY out of—Nos. 2, 4, 10, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 25, 26, 48, 49.

Ready for Delivery—We have just received from the Binders 100 copies of Vol. 8, Scientific American, which will be sold to the first applicants at $2,75 per volume. We also have about 50 complete sets of Volume 8, in sheets, which will be sold at the subscription price—$2 per set. Those who apply first will stand the best chance to get their orders filled, for after the above number are sold no more can be obtained at any price.

To Correspondents.—Condense your ideas into as brief space as possible, and write them out legibly, always remembering to add your name to the communication: anonymous letters receive no attention at this office. If you have questions to ask, do it in as few words as possible, and if you have some invention to describe, come right to the business at the commencement of your letter, and not fill up the best part of your sheet in making apologies for having the presumption to address us. We are always willing to impart information if we have the kind solicited.

Patent Laws, and Guide to Inventors—We publish, and have for sale, the Patent Laws of the United States—the pamphlet contains not only the laws but all information touching the rules and regulations of the Patent office. Price 12 1-2 cents per copy.

Binding.—We would suggest to those who desire to have their volumes bound, that they had better send their numbers to this office, and have them executed in a uniform style with their previous volumes. Price of binding 75 cents.

Foreign Subscribers—Our Canada and Nova Scotia patrons are solicited to compete with our citizens for the valuable prizes offered on the present volume. [It is important that all who reside out of the States should remember to send 25 cents additional to the published rates for each yearly subscriber—that amount we are obliged to pre-pay on postage.]

Receipts—When money is paid at the office for subscriptions, a receipt for it will always be given, but when subscribers remit their money by mail, they may consider the arrival of the first paper a bonafide acknowledgment of the receipt of their funds.

Back Numbers and Volumes—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement: Of Vols. 1, 2, 3, and 4—none. Of Vol. 5, all but six numbers, price, in sheets, $1; bound, $1,75. Of Vol. 6, all; price in sheets, $2; bound, $2,75. Of Vol. 7, all; price, in sheets, $2; bound, $2,75. Of Vol. 8, all; price, in sheets, $2; bound, $2,75.

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

Patentees—Remember we are always willing to execute and publish engravings of your inventions, providing they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engraving executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

Give Intelligible Directions—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post-office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post. office at which they wish to receive their paper, and the State in which the post-office is located.

Scientific Museum.

South American Protection from the Stroke of the Sun.

A very intelligent and distinguished gentleman of New Grenada has called to inform us, says the New York Courier, for the benefit of the public, that a very simple and most efficacious expedient is used in the hottest part of his country to prevent the stroke of the sun.

It consists merely in filling the upper part of the crown of the hat (which should be of straw, chip, or some other light material) with cotton. With this protection alone, he assures us, men labor in the fields in the hottest weather without injury. This is the case at Ocana, where the thermometer is not unfrequently from 114 to 120 degrees Fahrenheit in the sun. He once marched a division of troops under the direct rays of the sun, in one of the hottest valleys of the "tierras calientes," and they suffered no injury from the exposure, in consequence of taking this precaution.

It is found that cotton, better than anything else that has been tried, absorbs the heat from above, and at the same time transmits the moisture rising from the head. Knowing the great value of this practice in his own country, he hopes a notice of it in our newspapers may induce persons to make experiments, and introduce the habit of resorting to this useful expedient in hot weather.

Manufactured Superphosphate of Lime.

The "Genessee Farmer" has a sharp critique on the superphosphate of lime manufactured by Prof. Mapes, and considers it to have been too highly puffed by its maker, he having asserted that it could not be manufactured in England for less than $100 per ton, while the editor of the "Farmer" asserts that as good a manure is sold in London for $22½ per ton. He also reviews the criticism of Dr. Enderlin, on Prof. Johnson's analysis of Mape's superphosphate of lime, and shows that the learned critic must be a very Quixote in a chemical controversy. The editor of the "Genessee Farmer" appears to possess a mind of a strong logical character—common sense and clear—and he is well versed in agricultural chemistry.

Black Ants.

A correspondent enquires of us if we know of any remedy for "black ants." These insects are very numerous and troublesome in the garden of our correspondent. We do not know of any remedy ever tried to destroy these pests, but newly slacked lime and salt scattered freely over the ground, ought to destroy them. This remedy could not be easily applied in a garden, still with care it may be, so as to do some good. Mix the salt and lime together both dry, and dust them on the ground, taking care not to touch the flowers, &c. Digging open their nests and pouring boiling water upon them, will also destroy them.

Heat of Europe and America.

Again and again have we seen it asserted that when we have a warm summer in the United States, the countries of Europe on the same lines of latitude have a cold summer, and the same with respect to winters. We have never seen any facts adduced, nor can we give any reasons in proof of this being the case. This year we know it is not so, for the Spanish journals of Madrid state that on the 3rd of July, the heat was so excessive that the leaves of trees were shrivelled up, and much sickness caused by the extraordinary heat; which was no less than 110 deg. Fah.

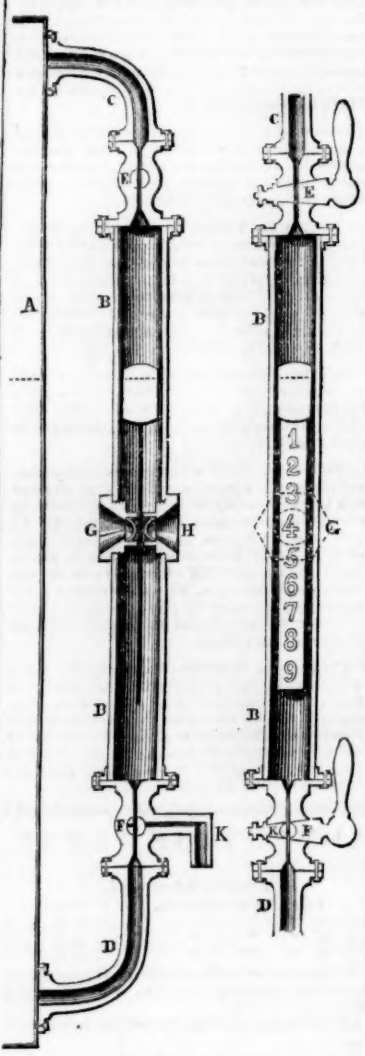
Leaves of Geraniums.

"Galignani's Messenger" says:—It is not generally known that the leaves of the geraniums are an excellent application for cuts, where the skin is rubbed off, and other wounds of that kind. One or two leaves must be bruised and applied on linen to the part, and the wound will become cicatrized in a very short time.

How to Keep Smoked Hams.

A writer in the "Farmer's Companion," published at Detroit, Mich., states that he has for many years preserved his hams through the summer, in the most perfect condition, by packing them in barrels, with layers of corn cobs between them, so that the hams would not come in contact with each other. They should be taken out and dry-rubbed once during the summer. The cask should be placed on a bench or trussel, in a cool, dry cellar.

Echols' Water Gauge for Steam Boilers.



The annexed engravings represent the Water and Steam Gauge of Joseph Echols', of Columbus, Georgia. Fig. 1 is longitudinal vertical section, and, fig. 2 is a front view. The same leters refer to like parts.

A is the boiler; B is a tube whose interior diameter is about 2 1-2 idches; C is a smaller tube, about 3-4 of an inch in diameter, connecting the upper end of B with the upper part of the boiler, and D is a similar tube connecting B with the lower part of the boiler; C and H are hollow nuts screwing into B opposite each other, the hollow in each forming a round passage through the centre of the nut which is enlarged at the inner end to the depth of 1-4 of an inch, so as to form a seat for a hollow half globe of glass which closes the opening, presenting its convex surface inwardly, and its concave surface outwardly; E and F are stop cocks which usually stand open in the position represented in the figures. The office common to both of them is to close the tubes C and D, when for any purpose it may become necessary to unscrew and take out either of the nuts; but F performs another office which will be presently explained. Attached to a float, running up and down with the surface of the water in B B, is a scale of inches numbered 1 2 3 &c. The float is represented in the figures as being at usual water line, bringing the figure 4 on the scale, between the two glasses before described, so that the figure can be distinctly seen by looking through the passage in the nuts, and through those glasses. As the actual quantity of the water in the boiler diminishes, whether it be foaming or not, the column of water in B B descends, and with it the float and the scale attached to it, bringing successively to view the figures 3, 2, and 1, so that when the float descends, so far as to rest on the glasses, exhibiting figure 1 on the scale, and presenting to the eye the surface of the water, the water line will have reached the lowest point of its range.

On the other hand when the actual quantity of water in the boiler increases until the surface of the column in B B reaches the highest point of its range, the float and attached scale will rise with it, bringing before the eye and between the glasses, the figures on the scale in numerical order, until the last one, figure 9 appears; so that at any and every moment a figure on the scale can be seen, indicating with infallible certainty the actual quantity of water in the boiler.

F is a three-way cock, placed in its usual position, its third and short passage is closed, and on bringing the handle down one quarter of a circle, the communication with the tube below will be cut off, and one opened outwardly from B B through the small discharge pipe K.—Now by this operation no water can be discharged besides that quantity, which may have been thus cut off above F. By receiving this quantity in a graduated cup, (knowing the capacity and diameter of B B) the point at which the water stood in it immediately before the operation, will be known with unerring accuracy, even were the places occupied by nuts and glasses filled up with solid metal, and the float and its scale removed. Were the apparatus to be used in this way, it need not be so long, and the lower end of it should be at a point on a level with that, below which the water in the boiler, when not foaming, should never be permitted to go. But leaving this mode of using the apparatus out of the question, F is a simple and efficient means of blowing out any obstructions in any of the passages above or below it, and of ascertaining at once whether any derangement of any kind, however small, may have taken place. For instance, if upon discharging water as just described, the water did not rise in B B to supply the place of that discharged, and thus carry the float and scale to their former position, it would be instantly known that an obstruction existed at some point below. This obstruction could be blown out by turning the handle of F back one half of a circle, leaving it in a horizontal position, for this operation would cut off the communication between B B and the small pipe K, and open one between the latter and the tube D discharging water alone, and by turning it one quarter of a circle further, leaving it pointing directly downward, a communication from above and below would be opened with the pipe K, and outwardly discharging both steam an water. It may be mentioned however, that were either the passage below F, or the one above it, to be materially obstructed, the upward and downward motion and agitation of the float and scale would be so much diminished as to indicate the fact distinctly at once. By placing a reflector behind the nut and glass G, the image of the figure on the scale which may at any time be at that point, may be distinctly seen from any selected position near it.

The advantages claimed for this invention are, first, that it is perfect and certain as the glass tubes now in use would be, if they were not liable to break, nor their transparency to be diminished by continual exposure to heat, because the two small pieces of glass, proposed to be used in connection with the float and scale, answer all the purposes of these tubes, and are not to any extent worthy of consideration liable to break, because each presents an arch to the presure of the steam, and being always covered with water, are not subjected to so great a heat, nor exposed to so great changes of temperature as are the tubes now in use; and if one should break, or its transparency become too much diminished, a duplicate can be substituted in two minutes of of time, by cutting off the communication between B B and the tubes C and D, and unscrewing the nut holding the glass to be removed, and setting in the duplicate; the cost of the latter not amounting to ten cents; to all which may be added the convenience and advantage before mentioned, of the three-way cocks F.

Mr. Echols is at present residing in this city, but his permanent residence is at Columbus.

Novel Way of Holding a Horse.

A gentleman travelling through Germany, thus describes a novel method of fastening a horse which he saw put in practice by a German blacksmith:—

"As soon as breakfast was over, I generally enjoyed the luxury of riding about town, and in passing the shop of a blacksmith, the manner in which he tackled and shod a vicious horse amused me. On the outside of the wall of the house, two rings were firmly fixed, to one of which the patient's head was fastened close to the ground; the hind foot to be shod stretched out to the utmost extent of the leg, was then secured by the other ring about five feet high, by a cord which passed through a cloven hitch, fixed to the root of the poor creature's tail.—The hind foot was consequently very much higher than the head; indeed, it was quite exalted, and pulled so heavily at the tail, that the animal seemed to be quite anxious to keep his oth er foot on terra firma. With one foot in the heavens, it did not suit him to kick; with his nose pointing to the infernal regions, he could not conveniently *rear*; and as a heavy band was constantly pulling at his tail, the horse at last gave up the point and quietly submitted to be shod."

LITERARY NOTICES.

THE MICROSCOPIST—Lindsay & Blackiston, of Philadelphia, have just published another beautiful edition of this able, excellent, and useful work, by Dr. Wythes. It illustrates and describes the different kinds of microscopes, and is a complete manual for its use. It tells how to observe and examine objects in nature, how to observe them, and all useful information for the lovers of science.

OVERMANS PRACTICAL MINERALOGY ASSAYING &C.—Another edition of this able work of the deceased F. Overman is just issued by the above Company, L. & B. of Philadelphia. It treats of Assaying and Mining, and gives a description of the useful minerals, with instructions for assaying and mining them. It is a practical work and is very useful.

LITTELL'S LIVING AGE—No. 486, of second series, just issued, contains excellent articles on the following subjects: History of the Prussian Court, Sunshine of Statistics, Rebellion in China, Beauty, the Paradise of Spain, A True Story, Bertha's Love, The Sisters of Provence, The Hop Garden, Turkish and European Crisis, New Russo-Danish Question, Poetry, and the usual judicious selection of short articles, are its contents.

THE INDUSTRY OF ALL NATIONS.—The V. & VI. numbers of this work, published by G. P. Putnam & Co. as a record of the New York Exhibition, Illustrated, has just been published, and contains some very excellent remarks, and a good number of neatly executed engravings of articles in the Exhibition, mostly all works of art, it presents an outside view of the beautiful fire engine of Mr. Jeffers, of Pawtucket R. I.

MINIFIE'S DRAWING BOOK.—Number 11 of this very excellent work is now ready, and is for sale at De Witt & Davenport, No. 160 Nassau st., N. X.